

Decision **PROPOSED DECISION OF ALJ FITCH** (Mailed 12/22/2021)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to
Continue Electric Integrated Resource
Planning and Related Procurement
Processes.

Rulemaking 20-05-003

DECISION ADOPTING 2021 PREFERRED SYSTEM PLAN

TABLE OF CONTENTS

Title	Page
DECISION ADOPTING 2021 PREFERRED SYSTEM PLAN	1
Summary	2
1. Procedural Background.....	4
1.1. Individual Integrated Resource Plan Filings.....	4
1.2. IRP Process Improvements	7
1.3. Preferred System Portfolio and Transmission Planning Process Recommendations	9
1.4. Fossil-Fueled Generation Issues	10
2. Evaluation of Individual Integrated Resource Plans	11
2.1. Review Approach	11
2.2. Treatment of Requirements for Impacts on Disadvantaged Communities	14
2.3. Overview of Disposition of Individual Plans.....	16
2.4. Resubmission Process for 2020 IRPs.....	18
2.5. Review of Individual LSE Plans	19
2.5.1. IOUs	19
2.5.2. CCAs	24
2.5.3. ESPs	48
2.5.4. Electric Cooperatives	63
3. Modifications to the IRP Cycle Process.....	65
3.1. Comments of Parties	65
3.2. Discussion	68
4. Preferred System Portfolio and GHG Target for 2030	71
4.1. Analysis Leading to PSP Portfolio and GHG Target Recommendation	72
4.1.1. Individual IRP Aggregation Analysis.....	72
4.1.2. Reliability Analysis of Aggregated LSE Plans.....	78
4.1.3. Capacity Expansion Modeling to Augment LSE Plans	81
4.1.4. Reliability Analysis of the 38 MMT Core Scenario	92
4.1.5. Proposed Preferred System Portfolio and 2030 GHG Target	94
4.2. Discussion	99
5. Portfolios for Use in CAISO 2022-2023 TPP	106
5.1. Base Case Portfolio	106
5.1.1. Comments of Parties.....	107
5.1.2. Discussion	108
5.2. Sensitivity Portfolio	109

5.2.1.	Comments of Parties.....	113
5.2.2.	Discussion	116
5.3.	Busbar Mapping	118
5.3.1.	Comments of Parties.....	119
5.3.2.	Discussion	120
6.	Potential Changes to Mid-Term Reliability Procurement Requirements	122
6.1.	Acceleration of Additional Procurement to 2023	122
6.1.1.	Comments of Parties.....	124
6.1.2.	Discussion	124
6.2.	Fossil-Fueled Generation Procurement.....	127
6.2.1.	Comments of Parties.....	128
6.2.2.	Discussion	131
6.3.	Other Necessary Clarifications	133
7.	Other Procurement Considerations to Achieve the Preferred System Portfolio	134
7.1.	Out-of-State Renewable Resources	134
7.1.1.	Comments of Parties.....	135
7.1.2.	Discussion	136
7.2.	Offshore Wind.....	138
7.2.1.	Offshore Wind Assumptions in TPP portfolios.....	140
7.2.2.	Central Coast Transmission Issues	141
7.3.	Development of Programmatic Procurement Requirements	143
7.3.1.	Comments of Parties.....	144
7.3.2.	Discussion	149
7.4.	Locationally-Targeted Procurement	153
7.4.1.	Storage Projects Substituting for Transmission Upgrades	153
7.4.2.	Aliso Canyon	159
7.5.	Definition of Renewable Hydrogen.....	163
7.5.1.	Comments of Parties.....	165
7.5.2.	Discussion	166
8.	Next Steps.....	167
9.	Comments on Proposed Decision.....	168
10.	Assignment of Proceeding	169
	Findings of Fact.....	169
	Conclusions of Law	172
	ORDER	176
	ATTACHMENT A:.....	181

Attachment A: Modeling Assumptions for the 2022-2023 Transmission
Planning Process

DECISION ADOPTING 2021 PREFERRED SYSTEM PLAN**Summary**

This decision evaluates the 2020 individual integrated resource plan (IRP) filings of all of the load serving entities (LSEs) under the Commission's IRP purview. Twenty LSEs have IRPs that are approved or certified in this decision; eight are determined to be exempt from the requirement to file an IRP in 2020. An additional 24 LSEs did not provide all of the required information in their IRPs and therefore their IRPs are not approved or certified in this decision. Those LSEs will have the opportunity to provide the required information in a Tier 2 Advice Letter and have their IRPs approved or certified after the subsequent filing.

This decision also adopts a Preferred System Plan (PSP) portfolio that meets a statewide 38 million metric ton (MMT) greenhouse gas (GHG) target for the electric sector in 2030. This portfolio was developed first with an aggregation of the individual IRPs of all LSEs, reflecting the resource preferences of those LSEs. Then, Commission staff made adjustments to extend the timeframe beyond 2030 to 2032 for transmission planning purposes and to add the resources required in Decision (D.) 21-06-035 for mid-term reliability (MTR) purposes. Finally, the portfolio utilizes a managed mid-demand paired with high electric vehicle (EV) demand forecast from the California Energy Commission's (CEC's) Integrated Energy Policy Report (IEPR) of 2020.

This decision further recommends to the California Independent System Operator (CAISO) that the 38 MMT PSP portfolio be utilized as both the reliability base case and the policy-driven base case for study in its 2022-2023 Transmission Planning Process (TPP). This decision also delegates to Commission staff to explore with CEC and CAISO staff the development of a

policy-driven sensitivity case designed to test the transmission buildout needed for a more aggressive GHG reduction case: the 30 MMT core portfolio with high electrification. Through the study of this case, we hope to learn more about the transmission buildout and cost implications of the lower GHG target, which we may consider for adoption for the years after 2030.

This decision also commits us to continuing a two-year IRP planning cycle, based primarily on consideration of individual LSE IRPs and adoption of a PSP every two years. A Reference System Plan (RSP) may still be considered intermittently, when needed for policy reasons, or if electric sector goals or broader state GHG emissions goals are changed. The due date for the next LSE IRPs will be September 1, 2022, with the next PSP adopted by the end of 2023.

This decision does not make any changes to the fundamental requirements of the MTR decision (D.21-06-035). Notably, fossil-fueled resources will remain ineligible for compliance with that order, but we will continue to evaluate and analyze system reliability needs throughout the next decade. This decision also adopts an interim definition of renewable hydrogen, pending further consideration of its eligibility to meet any IRP requirements in the future.

In terms of planning for new resources that require longer lead times for development, this decision includes in the PSP portfolio some out-of-state renewables and some offshore wind, and we expect to continue evaluating the need for more of these resources.

With respect to locationally-targeted procurement needs, this decision orders the procurement of two storage resources that were identified by the CAISO as alternatives to transmission upgrades in the previous TPP cycle. In addition, we commit to additional analysis of local resources that will help us to reduce reliance on the Aliso Canyon natural gas storage facility.

Finally, this decision commits to development of a programmatic structure for IRP procurement in our next two-year cycle, to ensure that LSEs optimize their procurement choices to achieve our three goals of reliability, GHG reductions, and least-cost procurement.

This proceeding remains open.

1. Procedural Background

The sections below detail the procedural background on the topics that will be addressed in this decision.

1.1. Individual Integrated Resource Plan Filings

This portion of this proceeding began with the filing of individual IRPs by load serving entities (LSEs) on or about September 1, 2020. Updated filings with corrections or changes in response to requests from Commission staff were filed on or about October 15, 2021. The entities filing individual IRPs, or notices of exempt status, were as follows:

Investor-Owned Utilities (IOUs)

- Bear Valley Electric Service (Bear Valley)
- Liberty Utilities (CalPeco Electric) (Liberty Utilities)
- Pacific Gas and Electric Company (PG&E)
- PacifiCorp
- San Diego Gas & Electric Company (SDG&E)
- Southern California Edison Company (SCE)

Electric Service Providers (ESPs)

- 3 Phases Renewables (3 Phases)
- American PowerNet Management, LP
- Calpine Energy Solutions, LLC (Calpine Solutions)
- Calpine PowerAmerica CA, LLC (Calpine PowerAmerica)

- Commercial Energy of Montana (Commercial Energy)
- Constellation NewEnergy, Inc. (Constellation)
- Direct Energy Business, LLC (Direct Energy)
- EDF Industrial Power Services (EDF Industrial)
- EnergyCal USA, LLC (dba YEP Energy)
- Gexa Energy California, LLC (Gexa)
- Liberty Power Delaware, LLC (Liberty Power)
- Liberty Power Holdings (Liberty Holdings)
- Pilot Power Group, Inc. (Pilot Power)
- Praxair Plainfield (Praxair)
- Regents of the University of California (UC Regents)
- Shell Energy North America (Shell)
- Tiger Natural Gas, Inc. (Tiger)

Community Choice Aggregators (CCAs)

- Apple Valley Choice Energy (AVCE)
- City of Baldwin Park
- City of Commerce
- City of Pomona
- Clean Energy Alliance
- CleanPower San Francisco (CleanPowerSF)
- Clean Power Alliance of Southern California (CPA)
- Desert Community Energy (Desert)
- East Bay Community Energy (EBCE)
- King City Community Power (KCCP)
- Lancaster Choice Energy (Lancaster)
- Marin Clean Energy (MCE)

- Monterey Bay Community Power Authority, which then changed its name to Central Coast Community Energy (CCCE)
- Peninsula Clean Energy Authority (PCE)
- Pico Rivera Innovative Municipal Energy (PRIME)
- Pioneer Community Energy (Pioneer)
- Rancho Mirage Energy Authority (Rancho Mirage)
- Redwood Coast Energy Authority (Redwood Coast)
- San Diego Community Power (SDCP)
- San Jacinto Power (San Jacinto)
- San Jose Clean Energy (SJCE)
- Santa Barbara Clean Energy (SBCE)
- Silicon Valley Clean Energy Authority (SVCEA)
- Solana Energy Alliance (Solana) (merged with Clean Energy Alliance)
- Sonoma Clean Power Authority (SCPA)
- Valley Clean Energy Alliance (VCE)
- Western Community Energy

Electric Cooperatives

- Anza Electric Cooperative (Anza), exemption filing on May 19, 2020 in R.16-02-007.
- Plumas Sierra Cooperative (Plumas Sierra), exemption filing on April 30, 2020, in R.16-02-007.
- Surprise Valley Electric Cooperative (Surprise Valley), exemption filing on August 3, 2020, in R.16-02-007.
- Valley Electric Association, Inc. (VEA), exemption filing on August 25, 2020.

On October 23, 2020, initial comments on the individual IRPs were filed by the following parties: American Wind Energy Association – California Caucus

(AWEA); California Energy Storage Alliance (CESA); California Environmental Justice Association (CEJA) and Sierra Club, jointly; CAISO; Eagle Crest Energy Company (Eagle Crest); Green Power Institute (GPI); GridLiance West (GridLiance); LS Power Development, LLC (LS Power); Ormat Technologies, Inc. (Ormat); Pattern Energy Group, LP (Pattern); Pattern and Southwestern Power Group II, LLC (SWPG), jointly; PCEA; Protect Our Communities Foundation (PCF); Small Business Utility Associates (SBUA); PG&E; SCE; and SDG&E.

1.2. IRP Process Improvements

One of the topics discussed upon initiation of this rulemaking, in responses to the order initiating rulemaking, as well as at the prehearing conference (PHC) and in subsequent comments, was whether the IRP schedule and process should be revised.

On June 15, 2020, the following sets of parties filed initial comments on the rulemaking, with many comments discussing, among other topics, the organization of the IRP process and schedule: Alliance for Retail Energy Markets (AReM); AWEA; Bioenergy Association of California (BAC); Brookfield Renewable Development (Brookfield); California Community Choice Association (CalCCA); California Hydrogen Business Council (CHBC); California Wind Energy Association (CalWEA); Calpine Corporation (Calpine); CAISO; CESA; Center for Energy Efficiency and Renewable Technologies (CEERT); City and County of San Francisco (CCSF); Defenders of Wildlife (DOW); Eagle Crest; Environmental Defense Fund (EDF); First Solar, Inc. (First Solar); Golden State Clean Energy (GSCE); GPI; L. Jan Reid (Reid); Long Duration Energy Storage Association of California (LDESAC); Middle River Power, Inc. (MRP); PCF; PG&E; Public Advocates Office at the California Public Utilities Commission (Cal Advocates); SBUA; SCE; SDCP; SDG&E; Sierra Club,

Natural Resources Defense Council (NRDC), CEJA, and Union of Concerned Scientists (UCS), jointly; Southern California Gas Company (SoCalGas); The Utility Reform Network (TURN); Vote Solar, Large Scale Solar Association (LSA), and Solar Energy Industries Association (SEIA), jointly; Wellhead Power Solutions (Wellhead); Western Grid Development, now known as California Western Grid (Western Grid); and Women's Energy Matters (WEM).

Reply comments were filed on July 6, 2020 by the following parties: AReM; AWEA; CAISO; Cal Advocates; CalCCA; Calpine; CalWEA; CEERT; CESA; CCSF; CHBC; Diamond Generating Corporation, Inc.-Sentinal (DGC); DOW; EDF; GridLiance; Independent Energy Producers Association (IEP); LDESAC; MRP; PCF; PG&E; Reid; SBUA; SCE; SDCP; SDG&E; Sierra Club, NRDC, CEJA, and UCS, jointly; SoCalGas; SWPG; Vote Solar, LSA, and SEIA, jointly; and WEM.

Comments in response to the PHC discussion were filed on July 24, 2020 by the following sets of parties: Advanced Energy Economy (AEE); AReM; AWEA; Brookfield; CAISO; Cal Advocates; CalCCA; CCSF; CEERT; CEJA, Sierra Club, UCS, and NRDC, jointly; Cogeneration Association of California (CAC); DOW; Green Hydrogen Coalition (GHC); GPI; GridLiance; GSCE; IEP; Liberty Utilities and PacifiCorp, jointly; PCE; PCF; PG&E; SCE; SDG&E; SoCalGas; Tesla, Inc. (Tesla); VoteSolar, LSA, and SEIA, jointly; Western Grid; and WEM.

In addition, on December 8, 2020, an Administrative Law Judge (ALJ) ruling was issued granting a motion by CEERT that formal comments be invited in response to an evaluation of the IRP process conducted in 2020 by Gridworks, under contract to the Commission.

Comments on the Gridworks evaluation of the IRP process were filed on December 18, 2020 by CEJA and Sierra Club, jointly. On December 22, 2020, the

following parties filed comments: CEERT; GPI; GridLiance; Middle River; PCF; PG&E; SBUA; SCE; SDG&E; and Vote Solar, LSA, and SEIA, jointly.

1.3. Preferred System Portfolio and Transmission Planning Process Recommendations

On August 17, 2021, an ALJ ruling was issued seeking comments from parties on the proposed preferred system plan, leading to this decision. The ruling included recommendations or proposals on all the topics covered in this decision.

Comments in response to the August 17, 2021 ALJ ruling with the proposed PSP were filed by the following parties: AEE; AWEA; BAC; Bay Area Transmission Group (BAMx); The Breakthrough Institute (Breakthrough); Brookfield; CAISO; CalCCA; Calpine; CalWEA; California Community Energy (CCE); Californians for Green Nuclear Power (CGNP); CCSF; CEJA and Sierra Club, jointly; CESA; California Municipal Utilities Association (CMUA); Coalition for the Optimization of Renewable Development (CORD); California Utility Employees (CUE); Western Grid; DOW; Diamond; EDF; GHC; GridLiance; GPI; GSCE; Hydrostor; IEP; LDESAC; LS Power; LSA, SEIA, and Vote Solar, jointly; Middle River; NRDC; Ormat; Cal Advocates; Pattern and SWPG, jointly; PCF; SCE; SDG&E; Shell; SoCalGas; TURN; TransWest; UCS; and Wartsila.

Reply comments in response to the August 17, 2021 ALJ ruling were filed by the following parties: AWEA; AReM; Breakthrough; CAISO; CalCCA; Cal Advocates; Calpine; CalWEA; CCSF; CEERT; CEJA and Sierra Club, jointly; CESA; CUE and California Unions for Reliable Energy (CURE); CMUA; Western Grid; Diamond; EDF; GHC; GridLiance; GPI; Hydrostor; IEP; LDESAC; LS Power; Middle River; Northern California Power Association (NCPA); NRDC;

Offshore Wind Coalition (OWC); Ormat; Pattern and SWPG, jointly; PCF; PG&E; SCE; SDG&E; SEIA, Vote Solar, and LSA, jointly; Shell; Six Cities; SoCalGas; TransCanyon, Inc. (TransCanyon); UCS; and Valley Electric Association (VEA).

1.4. Fossil-Fueled Generation Issues

On October 13, 2021, an ALJ email ruling was issued seeking comments from parties in response to two items related to procurement of natural gas generation. The first item was the California Energy Commission's (CEC's) Final Mid-term Reliability Analysis¹ that was anticipated and referred to in D.21-06-035. The second item was a Commission staff paper titled "Considering Gas Capacity Upgrades to Address Reliability Risk in Integrated Resource Planning."²

The following parties filed comments in response to the ALJ email ruling on or around October 21, 2021: AEE; AReM; BAC; CAISO; California Large Energy Consumers Association (CLECA); Cal Advocates; Calpine; CEJA, Sierra Club, and DOW, jointly; Center for Community Energy (CCE); CESA; CGNP; Diamond; EDF; GHC; GPI; IEP; Joint CCAs; Middle River; PCF; PG&E; SDG&E; Shell; SoCalGas; UCS and NRDC, jointly; and Wartsila.

Reply comments on or around October 28, 2021 were filed by the following parties: AEE; CalCCA; Calpine; CEJA, DOW, and Sierra Club, jointly; CLECA; Diamond; EDF; Electrochaea Corporation (Electrochaea); GPI; IEP; LDESAC;

¹ Available at the following link:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=239881&DocumentContentId=73322>

² This paper is available at the following link: <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2019-2020-irp-events-and-materials/cpuc-gas-upgrades-staff-paper-october-2021.pdf>

Middle River; PCF; PG&E; SCE; SEIA, Vote Solar, and LSA, jointly; SoCalGas; and Wartsila.

The Commission has also received a large number of individual public comments at Commission business meetings and on the “public comment” portion of the Docket Card for this proceeding on the topic of fossil-fueled generation issues. The majority of these comments have urged the Commission not to authorize any additional natural-gas-fueled generation and instead to require 100 percent zero-emitting resources to meet electric system needs going forward.

2. Evaluation of Individual Integrated Resource Plans

This section includes a summary of our review and evaluation of each individual LSE’s IRP. First, we describe the steps used to conduct the review. Then we include observations of common themes and issues across plans. Finally, we cover each LSE’s plan and whether it satisfied the Commission’s requirements for an IRP, leading to a finding of whether an LSE’s plan should be approved or certified, or whether a refiling is required.

2.1. Review Approach

D.18-02-018 contained the process and requirements for all LSEs to file individual IRPs with the Commission. D.20-03-028 also updated some filing requirements. Commission staff developed templates to help guide LSE submission of their individual IRPs, including a Narrative Template, a Resource Data Template (RDT), and a Clean System Power (CSP) calculator, where LSEs could input their existing and planned resources and calculate their GHG emissions output.

Once the individual IRPs were filed on or about September 1, 2020, Commission staff reviewed all aspects of each plan and requested numerous

updates from all LSEs to ensure accurate and comparable data for aggregation purposes.

Commission staff spent considerable time and effort iterating with individual LSEs through multiple re-submission requests from September 2020 through February 2021. These requests involved extensive consultation between Commission staff and LSEs to correct and clarify existing and planned contract information provided by the LSEs in their RDT and CSP filings. Staff also requested Narrative Template re-submissions if LSEs provided incomplete responses for any section (*i.e.*, if sections were not answered or not included in the LSE's filing). This effort culminated in the majority of LSEs re-filing amended information and ensured that the Commission was working from plans that fully reflect LSE planning and priorities.

Similar to the first set of IRP filings, in this round Commission staff also utilized a scorecard system to determine whether each LSE plan adequately satisfied the requirements established by the Commission.

In general, the plans varied widely in quality, and this experience will be used to update and refine individual filing requirements for the next cycle. For most LSEs, certain sections of the plan either satisfied or exceeded the Commission's requirements, while other sections of the same plan failed to satisfy other requirements. In the LSE scorecards (discussed further below), we use the term "adequate" to reflect a satisfactory fulfillment of the individual requirement; this score indicates that the LSE provided all of the required information. An "exemplary" score reflects surpassing requirements and potentially setting a standard for future best practices for other LSEs to emulate. For example, in the area of requirements to address disadvantaged communities, LSEs with an "exemplary" score not only provided the required information, but

also discussed their activities to address communities beyond just those technically defined as disadvantaged, and discussed other programs or efforts that are designed to further equity goals. Scores of “deficient” generally reflect a failure to meet the requirement or answer the question included in the template or in the statutory language that underlies the filing requirement.

Once staff determined that all the required materials and information with respect to resource plans and commitments were submitted, they assembled the aggregated portfolio of all LSE plans, utilizing the preferred conforming portfolios. More detail about this process is included in Section 3.1.1 below.

Commission staff then validated the integrity and consistency of the aggregated portfolio with physical system limits. Energy and resource adequacy contracts were tabulated by LSE, to ensure that contracts did not overlap and that capacity resources were not over-subscribed. This list was checked against the CAISO net qualifying capacity (NQC) list and the list of resources allocated via the cost allocation mechanism (CAM). Staff assessed which capacity resources remained uncontracted. Staff also confirmed that the estimates of transmission and resource potential limits from RESOLVE were not exceeded. Staff then aggregated the LSE-specific data to preserve confidentiality of information.

A full dataset of the aggregated LSE portfolios, including the list of baseline and new physical units, but not contract information, was posted to the Commission’s web site.³

³ This data is available at the following link: <https://www.cpuc.c.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/2019-20-irp-events-and-materials>

Finally, Commission staff conducted production cost modeling of the aggregated LSE portfolio datasets. The Strategic Energy Risk Valuation Model (SERVM) was used to measure operational performance and system reliability.

2.2. Treatment of Requirements for Impacts on Disadvantaged Communities

The Commission's Environmental and Social Justice Action Plan includes several important actions related to Commission policy on reliability and GHG reductions, including a review of IRP plans for the impacts on disadvantaged communities.⁴ Commission staff reviewed the individual LSE plans for compliance with all requirements previously set by the Commission. Since this is the second set of individual IRPs filed, we set a slightly higher standard of review for the 2020 plans than the 2018 plans.

As with the 2018 plans, one area where there is a great deal of variation in treatment is with respect to the requirements to address impacts on disadvantaged communities. Commission staff noted the following high-level observations about how the LSEs handled these aspects of their plans.

The majority of LSEs followed filing instructions and provided descriptions of the disadvantaged communities they serve, if any, using the definition provided in the Narrative Template. As described in the Narrative Template, for the purposes of IRP, a disadvantaged community is defined as any community statewide scoring in the top 25 percent statewide or in one of the 22 census tracts within the top five percent of communities with the highest pollution burden that do not have an overall score. As instructed, LSEs used the

⁴ The Environmental and Social Justice Action Plan is available at: <https://www.cpuc.ca.gov/news-and-updates/newsroom/environmental-and-social-justice-action-plan>

CalEnviroScreen 3.0 tool for this purpose. The majority of the LSEs also specified customers served in disadvantaged communities along with the total disadvantaged population number served as a percentage of the total number of customers served. A few LSEs exceeded the requirements by specifying low-income communities, which were not necessarily marked as disadvantaged communities by the ranking definition.

Several LSEs noted that they do not serve any disadvantaged communities, and therefore did not address the topic further. However, even if they do not specifically serve disadvantaged communities as part of their customer base, almost all LSEs have impacts on disadvantaged communities, at least indirectly, as a result of their reliance on some system power or other power with local pollutant or GHG emissions, which can still impact disadvantaged communities. We note that for future IRPs, we expect the LSEs to take a more expansive view of their responsibilities in this area, and describe their efforts to address disadvantaged community impacts, not only in their own service areas, but also in the state as a whole. Along with the impacts, the LSEs should also address programs and activities they offer to mitigate these impacts.

Many LSEs that do serve disadvantaged communities, in addition, did not provide specific quantitative evidence of how their preferred portfolios minimized local air pollutants, with early priority on disadvantaged communities. These LSEs provided general, qualitative statements that their plans are consistent with the goal of minimizing local air pollutants with early priority on disadvantaged communities and that they have considered the impact of their resource procurements on disadvantaged communities. This was the case as well for many LSEs in terms of their current and planned activities and programs addressing disadvantaged communities. These LSEs only

provided general statements on their activities and programs. For their next IRP filings, we expect more specific information from all LSEs.

Some LSEs in their 2020 IRPs did provide detailed activities and programs focusing on disadvantaged communities, including procurement opportunities to reduce reliance on fossil-fueled power plants, affordability programs, transportation and building electrification, energy efficiency, demand response, residential solar, outreach programs, education and training programs, recruiting and hiring, and others. These are the sorts of activities we expect to have detailed by all LSEs going forward in their individual IRPs. In Section 2.5 below, we identify the LSEs with deficiencies and those that provided exemplary information.

As discussed further in Section 3 below for the next set of IRP filings, we anticipate Commission staff updating the individual IRP filing requirements and we will provide additional direction in a ruling in this proceeding disseminating those requirements by no later than May 1, 2022.

2.3. Overview of Disposition of Individual Plans

Table 1 below summarizes the disposition of the individual IRPs filed by all LSEs. In the case of ESPs and IOUs, their IRPs are either “approved” or “not yet approved” pending the refiling of the IRPs with the missing information via Tier 2 Advice Letter as discussed in Section 2.3.1 below. In the case of CCAs, their IRPs are either “certified” or “not yet certified,” also pending refiling of the IRPs with the missing information via Advice Letter. Also included are those LSEs whose filings are approved as “exempt” from the requirement to file an IRP, though those entities are still required to file information substantiating their eligibility for an exemption on each required IRP filing date in the future.

**Table 1. Summary of Disposition of
Individual LSE 2018 IRP Filings**

#	LSE	LSE Type	Approved or Certified	Not Yet Approved or Certified
1	3 Phases Renewables	ESP		X
2	American PowerNet Management	ESP		X
3	Anza Electric Cooperative	Coop	Exempt	
4	Apple Valley Choice Energy	CCA	X	
5	Bear Valley Electric	IOU	X	
6	Calpine Energy Solutions	ESP		X
7	Calpine PowerAmerica CA	ESP		X
8	Central Coast Community Energy	CCA	X	
9	City of Baldwin Park	CCA		X*
10	City of Commerce	CCA	X	
11	City of Pomona	CCA		X
12	Clean Energy Alliance	CCA	X	
13	Clean Power Alliance of Southern California	CCA		X
14	CleanPower San Francisco	CCA	X	
15	Commercial Energy of Montana	ESP		X
16	Constellation NewEnergy	ESP		X
17	Desert Community Energy	CCA		X
18	Direct Energy Business	ESP		X
19	East Bay Community Energy	CCA	X	
20	EDF Industrial Power Services	ESP		X
21	EnergyCal USA (YEP Energy)	ESP	Exempt	
22	Gexa Energy California	ESP	Exempt	
23	King City Community Power	CCA		X
24	Lancaster Choice Energy	CCA		X
25	Liberty Power Delaware	ESP	Exempt	
26	Liberty Power Holdings	ESP	Exempt	
27	Liberty Utilities (CalPeco Electric)	IOU	X	
28	Marin Clean Energy	CCA	X	
29	Pacific Gas and Electric	IOU	X	
30	PacifiCorp	IOU	X	
31	Peninsula Clean Energy Authority	CCA	X	
32	Pico Rivera Innovative Municipal Energy	CCA		X
33	Pilot Power Group	ESP		X

#	LSE	LSE Type	Approved or Certified	Not Yet Approved or Certified
34	Pioneer Community Energy	CCA	X	
35	Plumas Sierra Cooperative	Coop	Exempt	
36	Praxair Plainfield	ESP	Exempt	
37	Rancho Mirage Energy Authority	CCA	X	
38	Redwood Coast Energy Authority	CCA	X	
39	Regents of the University of California	ESP		X
40	San Diego Community Power	CCA		X
41	San Diego Gas & Electric	IOU	X	
42	San Jacinto Power	CCA		X
43	San Jose Clean Energy	CCA	X	
44	Santa Barbara Clean Energy	CCA	X	
45	Shell Energy	ESP		X
46	Silicon Valley Clean Energy Authority	CCA	X	
47	Sonoma Clean Power Authority	CCA		X
48	Southern California Edison	IOU	X	
49	Surprise Valley Electric Cooperative	Coop	Exempt	
50	Tiger Natural Gas	ESP		X
51	Valley Clean Energy Alliance	CCA	X	
52	Valley Electric Association	Coop	Exempt	
53	Western Community Energy	CCA		X*

* These two CCAs have notified the Commission of their deregistration and that they will no longer plan to serve customers.

2.4. Resubmission Process for 2020 IRPs

For those entities who have parts of their IRPs that are determined to be “deficient,” their plans are not approved (in the case of IOUs and ESPs) or not certified (in the case of CCAs) in this decision, as summarized in the table above.

In order to remedy these deficiencies, we will require that the LSE file a Tier 2 Advice Letter by no later than April 1, 2022, providing, at a minimum, an appendix or supplement to its IRP, with the missing or inadequate information

from the September 2020 and/or October 2021 versions. New resource data templates or other attachments are not required. The next section includes more detailed guidance to each LSE about the information it needs to improve in order to have its IRP approved or certified by Commission staff via the Advice Letter process.

2.5. Review of Individual LSE Plans

This section includes the scorecards for each LSE. Below the scorecard is a summary of the next steps required for that LSE, if any. A more detailed version of these scorecards, with staff comments included, can be found at the following link: <https://www.cpuc.c.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/2019-20-irp-events-and-materials>.

2.5.1. IOUs

Bear Valley Electric Service

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Exemplary
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
	Proposed activities	Adequate

Area	Specific Requirement	Assessment
Action Plan	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None

Liberty Utilities (CalPeco Electric)

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Pacific Gas and Electric Company

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Exemplary
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Exemplary
	Proposed activities specific to disadvantaged communities	Exemplary
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Exemplary

Resubmission requirements to address deficient items:

- None

PacifiCorp

PacifiCorp is a multi-jurisdictional utility serving six states, that files its IRP as a non-standard plan. PacifiCorp is required to supplement its multi-state IRP with a specific information on two items: 1) another (non-CSP

calculator) method to fulfill requirements that would otherwise have required the CSP tool and justification for the choice; 2) a separate demonstration that satisfies the requirements for disadvantaged communities.

Specific Requirement	Assessment
Required forms and IRP prepared for other jurisdictions	Adequate
Treatment of Disadvantaged Communities	Adequate
GHG Target Planning	Adequate

Resubmission requirements to address deficient items:

- None

San Diego Gas & Electric

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Exemplary
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Exemplary

Resubmission requirements to address deficient items:

- None.

Southern California Edison

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Exemplary
	Modeling Approach	Exemplary
Study Results	Conforming and Alternative Portfolios	Exemplary
	Preferred Conforming Portfolios	Exemplary
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Exemplary
	System reliability analysis	Exemplary
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Exemplary

Resubmission requirements to address deficient items:

- None.

2.5.2. CCAs

Apple Valley Choice Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Exemplary
	Barrier analysis	Exemplary
	Proposed Commission direction	Exemplary
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Central Coast Community Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
	Conforming and Alternative Portfolios	Adequate

Area	Specific Requirement	Assessment
Study Results	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Exemplary
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

City of Baldwin Park

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate

Area	Specific Requirement	Assessment
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

We note that the City of Baldwin Park served notice on October 18, 2021 in this proceeding that it no longer intends to serve customers as a CCA. In light of this information, Baldwin Park may resubmit the following items, or may submit its notice of withdrawal, to close out the status of its 2020 IRP requirements:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

City of Commerce

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

City of Pomona

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate

Area	Specific Requirement	Assessment
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

Clean Energy Alliance

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Clean Power Alliance of Southern California

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Exemplary
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate

Area	Specific Requirement	Assessment
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Exemplary
	System reliability analysis	Exemplary
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Exemplary
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.
- Provide: 1) a description of what disadvantaged communities it serves; 2) specific customers served in disadvantaged communities, along with total disadvantaged population number served, as a percentage of total number of customers served, as required by Section 3d of the Narrative Template.

CleanPowerSF

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate

Area	Specific Requirement	Assessment
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Exemplary
	Preferred Conforming Portfolios	Exemplary
	GHG emissions results	Exemplary
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Exemplary
	System reliability analysis	Adequate
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Exemplary
Action Plan	Proposed activities	Exemplary
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Exemplary
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Exemplary
Lessons learned		Exemplary

Resubmission requirements to address deficient items:

- None.

Desert Community Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate

Area	Specific Requirement	Assessment
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement, as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.

East Bay Community Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Exemplary
	System reliability analysis	Exemplary
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Exemplary
	Transmission development	Adequate
	Proposed activities	Adequate

Area	Specific Requirement	Assessment
Action Plan	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

King City Community Power

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement, as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.

Lancaster Choice Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address

disadvantaged communities, and describe how its actions and engagement have changed over time.

- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

Marin Clean Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Exemplary
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Peninsula Clean Energy Authority

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Exemplary
	Modeling Approach	Exemplary
Study Results	Conforming and Alternative Portfolios	Exemplary
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Exemplary
	System reliability analysis	Exemplary
	Hydro generation risk management	Exemplary
	Long-duration storage development	Exemplary
	Out-of-state wind development	Exemplary
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Exemplary
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Pico Rivera Innovative Municipal Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate

Area	Specific Requirement	Assessment
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those

located within disadvantaged communities, as required by section 4a of the Narrative Template.

Pioneer Community Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Rancho Mirage Energy Authority

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate

	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Redwood Coast Energy Authority

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Exemplary
	Preferred Conforming Portfolios	Exemplary
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate

Area	Specific Requirement	Assessment
Action Plan	Out-of-state wind development	Adequate
	Transmission development	Adequate
	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
Lessons learned	Diablo Canyon replacement	Adequate
		Exemplary

Resubmission requirements to address deficient items:

- None.

San Diego Community Power

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate

Area	Specific Requirement	Assessment
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

San Jacinto Power

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate

Area	Specific Requirement	Assessment
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

San Jose Clean Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Exemplary
	Modeling Approach	Exemplary
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate

Area	Specific Requirement	Assessment
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Adequate
	System reliability analysis	Exemplary
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Santa Barbara Clean Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Adequate
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
	Proposed activities	Adequate

Area	Specific Requirement	Assessment
Action Plan	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Silicon Valley Clean Energy Authority

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Exemplary
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Exemplary
	Long-duration storage development	Adequate
	Out-of-state wind development	Exemplary
	Transmission development	Exemplary
Action Plan	Proposed activities	Exemplary
	Proposed activities specific to disadvantaged communities	Exemplary
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Sonoma Clean Power Authority

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Deficient
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on approach to considering cost and rate impacts on its customers, as required by Section 3e of the Narrative Template.

Valley Clean Energy Alliance

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate

Area	Specific Requirement	Assessment
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Exemplary
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Exemplary
	Cost and rate analysis	Exemplary
	System reliability analysis	Adequate
	Hydro generation risk management	Exemplary
	Long-duration storage development	Exemplary
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- None.

Western Community Energy

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate

Area	Specific Requirement	Assessment
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

We note that Western Community Energy served notice as of June 10, 2021 in this proceeding that it no longer intends to serve customers as a CCA. In light of this information, Western Community Energy may resubmit the following items, or may submit its notice of withdrawal, to close out the status of its 2020 IRP requirements:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.
- Provide: 1) a description of what disadvantaged communities it serves; 2) specify customers served in disadvantaged communities along with total disadvantaged population number served as a percentage of total number of customers served, as required by Section 3d of the Narrative Template.
- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address

disadvantaged communities, and describe how its actions and engagement have changed over time.

2.5.3. ESPs

3 Phases Renewables, Inc.

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Deficient
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Deficient
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.

- Provide specific details on approach to considering cost and rate impacts on customers, as required by Section 3e of the Narrative Template.
- Provide specific details to identify when and how it proposes to undertake resource procurement identified in its 38 MMT Preferred Conforming Portfolio, as required by Section 4b of the Narrative Template. Describe the type of solicitation(s), when the solicitation(s) is expected to take place, the desired online dates of projects requested, and other relevant procurement planning information.

American PowerNet Management, LP

American PowerNet's (APN's) filing stated that it: "provides this notification to the Commission that given a current lack of information necessary for APN to provide a formal, detailed procurement planning analysis, APN is not providing the Integrated Resource Plan ("IRP") templates or narrative at this time. APN is working to secure additional procurement planning information and will continue to work with and provide updates to the Commission as details develop."

The filing did not include any detail on why this information is unavailable. Thus, we do not find, on the basis of the filing, that APN is exempt. APN is required, as a result of this decision, to provide additional detail addressing whether it is currently serving load in California. If not, APN is required to include in its compliance filing, the necessary Narrative Template information required for the individual IRP.

Calpine Energy Solutions, LLC

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate

	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.
- Provide a description of what disadvantaged communities it serves, as required by Section 3d of the Narrative Template.
- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.

- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

Calpine PowerAmerica-CA, LLC

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.
- Provide: 1) a description of what disadvantaged communities it serves; 2) specify customers served in disadvantaged communities along with total disadvantaged population number served as a percentage of total number of customers served, as required by Section 3d of the Narrative Template.
- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

Commercial Energy of Montana

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Deficient
	Preferred Conforming Portfolios	Deficient

	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Deficient
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a narrative summary of its conforming portfolios, as required by Section 3a of the Narrative Template, including, at a minimum, a summary of the contracted and planned resources reported in its 38 MMT RDT.
- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.
- Provide: 1) a description of what disadvantaged communities it serves; 2) specify customers served in disadvantaged communities along with total disadvantaged population number served as a percentage of total number of customers served, as required by Section 3d of the Narrative Template.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the

implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.

- Provide commentary that supports specific resource location information provided in its 38 MMT Preferred Conforming RDT, as required in Section 3j of the Narrative Template. For resources that do not yet have an interconnection queue position, identify a specific location as appropriate for the current stage of planning.

Constellation NewEnergy, Inc.

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate

Area	Specific Requirement	Assessment
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.

Direct Energy Business, LLC

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Exemplary
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of what disadvantaged communities it serves, as required by Section 3d of the Narrative Template.

EDF Industrial Power Services CA, LLC

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Deficient
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Deficient
	Barrier analysis	Deficient
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of what disadvantaged communities it serves, as required by Section 3d of the Narrative Template.
- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address

disadvantaged communities, and describe how its actions and engagement have changed over time.

- Provide specific details on its approach to considering cost and rate impacts on its customers, as required by Section 3e of the Narrative Template.
- Provide specific details to identify when and how it proposes to undertake resource procurement identified in its 38 MMT Preferred Conforming Portfolio, as required by Section 4b of the Narrative Template. Describe the type of solicitation(s), when the solicitation(s) is expected to take place, the desired online dates of projects requested, and other relevant procurement planning information.
- Identify any market, regulatory, financial, or other barriers or risks associated with its 38 MMT Preferred Portfolio, along with an analysis of risks associated with potential retirement of existing resources on which it intends to rely in the future, as required by Section 4c of the Narrative Template.

EnerCal USA (doing business as (dba) YEP Energy)

EnerCal USA filed for an exemption from the requirement to file a full IRP because it was not yet serving load in California. Thus, we grant an exemption, as provided for in D.20-03-028.

Gexa Energy

Gexa's filing stated that it has not served load in California since 2016 and has no future plans to serve load. Based on this representation, Gexa is exempt from filing an IRP, as provided for in D.20-03-028.

Liberty Power Delaware

Liberty Power Delaware's filing stated that it has never served load in California and has no future plans to serve load. Based on this representation,

Liberty Power Delaware is exempt from filing an IRP, as provided for in D.20-03-028.

Liberty Power Holdings

Liberty Power Holdings' filing stated that it has not served load in California since 2016 and has no future plans to serve load. Based on this representation, Liberty Power Holdings is exempt from filing an IRP, as provided for in D.20-03-028.

Pilot Power Group, Inc.

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Adequate
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.
- Provide a description of what disadvantaged communities it serves, as required by Section 3d of the Narrative Template.
- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.

Praxair Plainfield

Praxair's filing stated that it has not served load in California since 2008 and has no future plans to serve load. Based on this representation, Praxair is exempt from filing an IRP, as provided for in D.20-03-028.

The Regents of the University of California

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Exemplary
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate

Area	Specific Requirement	Assessment
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Deficient
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on planned activities to conduct outreach and seek input from disadvantaged communities that could be impacted by procurement resulting from the implementation of the 38 MMT Plan, as well as any activities to minimize criteria air pollutants, with priority on disadvantaged communities and activities targeted at identifying feasible procurement opportunities to reduce reliance on fossil-fueled power plants, particularly those located within disadvantaged communities, as required by section 4a of the Narrative Template.
- Provide specific details to identify when and how it proposes to undertake resource procurement identified in its 38 MMT Preferred Conforming Portfolio, as required by Section 4b of the Narrative Template. Describe the type of solicitation(s), when the solicitation(s) is expected to take place, the desired online dates of projects requested, and other relevant procurement planning information.

Shell Energy North America

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Deficient
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Adequate
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Adequate
	Procurement activities	Deficient
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide a description of how the selection of resources in their 38 MMT preferred conforming portfolio is consistent with each relevant statutory and administrative requirement as described in Public Utilities Code Section 454.52(a)(1), as required by Section 3b of the Narrative Template.
- Provide a description of what disadvantaged communities it serves, as required by Section 3d of the Narrative Template.

- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details to identify when and how it proposes to undertake resource procurement identified in its 38 MMT Preferred Conforming Portfolio, as required by Section 4b of the Narrative Template. Describe the type of solicitation(s), when the solicitation(s) is expected to take place, the desired online dates of projects requested, and other relevant procurement planning information.

Tiger Natural Gas, Inc.

Area	Specific Requirement	Assessment
Executive Summary		Adequate
Study Design	Objectives	Adequate
	Modeling Tools	Adequate
	Modeling Approach	Adequate
Study Results	Conforming and Alternative Portfolios	Adequate
	Preferred Conforming Portfolios	Adequate
	GHG emissions results	Adequate
	Local air pollutants	Adequate
	Focus on disadvantaged communities	Deficient
	Cost and rate analysis	Deficient
	System reliability analysis	Adequate
	Hydro generation risk management	Adequate
	Long-duration storage development	Adequate
	Out-of-state wind development	Adequate
	Transmission development	Adequate
Action Plan	Proposed activities	Adequate
	Proposed activities specific to disadvantaged communities	Deficient
	Procurement activities	Deficient
	Barrier analysis	Adequate
	Proposed Commission direction	Adequate
	Diablo Canyon replacement	Adequate

Area	Specific Requirement	Assessment
Lessons learned		Adequate

Resubmission requirements to address deficient items:

- Provide: 1) a description of what disadvantaged communities it serves; 2) specific customers served in disadvantaged communities, along with total disadvantaged population number served, as a percentage of total number of customers served, as required by Section 3d of the Narrative Template.
- Provide specific details on activities to address disadvantaged communities, as required by Section 3d of the Narrative Template, specifying what current and planned activities/programs, if any, address disadvantaged communities, and describe how its actions and engagement have changed over time.
- Provide specific details on its approach to considering cost and rate impacts on its customers, as required by Section 3e of the Narrative Template.
- Provide specific details to identify when and how it proposes to undertake resource procurement identified in its 38 MMT Preferred Conforming Portfolio, as required by Section 4b of the Narrative Template. Describe the type of solicitation(s), when the solicitation(s) is expected to take place, the desired online dates of projects requested, and other relevant procurement planning information.

2.5.4. Electric Cooperatives

Anza Electric Cooperative

As evidence of Anza's exemption from the requirement to file an IRP, Anza submitted the following materials:

- Exempt Small Electric Cooperative Narrative
- 2017 EIA-861, Schedule 2, Part B
- 2018 EIA-861, Schedule 2, Part B

- 2019 EIA-861, Schedule 2, Part B

We have reviewed these materials and approve Anza's exemption from the requirement to file an IRP in 2020.

Plumas-Sierra Rural Electric Cooperative

As evidence of Plumas-Sierra's exemption from the requirement to file an IRP, Plumas-Sierra submitted the following materials:

- Exempt Small Electric Cooperative Narrative
- 2017 EIA-861, Schedule 2, Part B
- 2018 EIA-861, Schedule 2, Part B
- 2019 EIA-861, Schedule 2, Part B

We have reviewed these materials and approve Plumas-Sierra's exemption from the requirement to file an IRP in 2020.

Surprise Valley Electric Corp

As evidence of Surprise Valley's exemption from the requirement to file an IRP, Surprise Valley submitted the following materials:

- Exempt Small Electric Cooperative Narrative
- 2017 EIA-861, Schedule 2, Part B
- 2018 EIA-861, Schedule 2, Part B
- 2019 EIA-861, Schedule 2, Part B

We have reviewed these materials and approve Surprise Valley's exemption from the requirement to file an IRP in 2020.

Valley Electric Association, Inc.

As evidence of VEA's exemption from the requirement to file an IRP, VEA submitted the following materials:

- Exempt Small Electric Cooperative Narrative
- 2017 EIA-861, Schedule 2, Part B, and Schedule 4, Part A

- 2018 EIA-861, Schedule 2, Part B, and Schedule 4, Part A
- 2019 EIA-861, Schedule 2, Part B, and Schedule 4, Part A

We have reviewed these materials and approve VEA's exemption from the requirement to file an IRP in 2020.

3. Modifications to the IRP Cycle Process

When this proceeding was initiated, parties were asked to weigh in on the structure and timing of the IRP process, as one full cycle had been completed at that point. With this decision, a second cycle will be complete.

Parties were specifically asked about preferences for a two-year or three-year IRP cycle, the split between the "planning" and "procurement" functions and tracks in the proceeding, as well as specific analyses that parties want to see performed.

3.1. Comments of Parties

The following general themes emerged from the comments and reply comments on the order instituting rulemaking (OIR) that initiated this proceeding itself.

First, numerous parties, including CAISO, Brookfield, Eagle Crest, and CESA, argued that a procurement decision must be expedited to address mid-term (2023-2026) reliability needs, including the replacement of capacity from the Diablo Canyon Power Plant. This issue has been addressed by D.21-06-035.

A few parties recommended that the Commission initiate a stakeholder process focused on redesigning the IRP process and schedule.

SCE recommended the development of robust reliability planning standards, and suggested that the planning track should focus on developing modeling methods that better optimize distributed energy resources.

Numerous parties expressed concerns with the idea of converting from a two-year to a three-year cycle, including SCE, EDF, CESA, CAISO, SDG&E, and PG&E. SDG&E would support maintaining a two-year cycle if the RSP was discontinued. PG&E suggested a two-year cycle for mid-term procurement (5-8 years ahead) and a four-year cycle for long-term procurement. PG&E would also eliminate one of the RSP or PSP modeling processes to increase efficiency. CAISO suggested eliminating either the RSP or the PSP. Vote Solar, LSA, and SEIA suggested that if the two-year cycle is retained, the RSP should be eliminated. CESA recommended sticking with the current two-year cycle to reflect changing market dynamics.

Many parties also focused on the need for locational analysis (beyond just the system level) and active planning for retirement of the natural gas fleet. These parties included Brookfield, Sierra Club, CEJA, NRDC, UCS, PG&E, CalCCA, Calpine, Middle River, TURN, Cal Advocates, CAISO, DOW, CESA, CalWEA, and Western Grid. Different parties had different emphases on particular aspects of locational analysis, including disadvantaged communities, local reliability areas (including the need to retain certain natural gas plants), and transmission alternatives. Several parties focused on the need for better coordination between resource adequacy and the IRP process, at the system level and more specifically focused on local reliability area needs.

Finally, several parties, including Brookfield, BAC, AWEA, CESA, Vote Solar, LSA, SEIA, EDF, and SoCalGas, recommended a planning horizon extending out to 2045, and not just the standard ten-year period.

At the PHC in mid-2020, there was discussion of two options for proceeding with organization of the IRP cycles:

Option 1: Basically the status quo, with a RSP in the first year, LSE Plans, aggregation, and then adoption of a PSP at the end of the second year.

Option 2: Focus on long-term locational planning analysis, followed by giving planning and procurement direction to LSEs.

The general themes from party comments and replies in response to the PHC discussion included preference for a hybrid approach that completes the regular IRP cycle as originally conceived, while also addressing the locational planning analysis.

In general, LSEs or organizations representing LSEs were more in favor of maintaining the general status quo approach to IRP. Others suggested we “work smarter, not harder” and attempt to complete both options simultaneously.

There was also no clear consensus in comments about whether a two-year or three-year cycle would be optimal, though more parties tended to favor continuing to try for a two-year cycle because of market changes that occur more frequently.

In addition to comments on the OIR itself and the PHC discussion, numerous parties offered thoughtful comments in response to the Gridworks evaluation of the IRP process, including CEJA, Sierra Club, CEERT, GPI, GridLiance, Middle River, PG&E, PCF, SDG&E, SBUA, SCE, Vote Solar, LSA, and SEIA.

Overall, most parties supported most of the findings and recommendations of Gridworks, including the following recommendations for the Commission:

- Holding more En Banc hearings and all-party meetings to increase the transparency of the IRP process.

- Greater interagency coordination, including public meetings among principals from the Commission, CEC, CAISO, and the California Air Resources Board (CARB).
- Clarifying and coordinating the respective roles of the IRP and resource adequacy proceedings.
- Maintaining a two-year IRP process. No party expressed support for conversion to a three-year process, in this context.

Parties were evenly divided on the concept of delegating the development and vetting of inputs and assumptions for the IRP process to outside consultants, as discussed by Gridworks in their evaluation.

SDG&E expressed concerns with de-emphasizing the PSP, and PG&E again suggested eliminating one of the extensive modeling processes, either to support the RSP or the PSP.

3.2. Discussion

As Commission staff and parties have generally acknowledged in multiple venues, it has been difficult for the Commission to accomplish the development and adoption of both an RSP and a PSP within one two-year cycle timeframe. In addition, the original vision was that procurement could be ordered in association with the adoption of either an RSP or a PSP. So far, however, procurement orders have had to come separately and on a different track, mostly due to timing urgency. This creates the potential for disconnection between the planning and procurement processes.

In addition, there are several issues that are becoming more urgent to look at systematically during the IRP process, including locational analysis, retention of needed existing resources, potential for additional resource retirements, as well as development of a programmatic approach to procurement to achieve GHG emissions targets while maintaining reliability.

In order to accommodate the additional work that needs to occur within the IRP context, at this time we will reform the IRP two-year cycle to focus primarily on adoption of a PSP every two years. This will mean that each time the Commission adopts an aggregated portfolio for the CAISO system as a whole, it will be based on the aggregation of the individual plans submitted by all of the LSEs, reflecting their individual procurement preferences.

While we will no longer plan to adopt an RSP every two years, we will not eliminate the concept of an RSP entirely. Since the RSP is more of a theoretical analysis developed by Commission staff to guide planning, we will reserve the option to conduct an RSP analysis intermittently, as needed, and as the policy context dictates. For example, an RSP analysis may be appropriate if the GHG emissions goals for the electric sector are significantly modified, either through legislation or by the CARB Scoping Plan process, which is updated at least every five years. In addition, as the ten-year planning timeframe shifts further beyond year 2030, RSP-like modeling and analysis may be necessary to evaluate whether the electric sector remains on track to achieve the state's 2045 goals. Another circumstance that might inspire the development of an RSP on an intermittent basis would be the breakthrough availability of a new resource type in large quantities, such as offshore wind or carbon capture and storage.

Eliminating the expectation of an RSP every two years during each IRP cycle, however, does not eliminate some of the work that would normally be associated with RSP adoption. Inputs and assumptions for modeling will still need to be updated in order to enable individual IRP planning by LSEs, followed by aggregation and analysis of the individual IRP filings. These inputs and assumptions also underpin the analysis used to develop TPP portfolios at regular intervals, as well as the provision of information and analysis to other

proceedings. We also intend to continue using the same modeling tools, namely RESOLVE and SERVM, and those tools will need to be maintained and updated with current assumptions.

However, we will eliminate the need to conduct a full set of RESOLVE and SERVM modeling on an RSP to be adopted every two years. We will reserve the adoption of an RSP to times when we determine that our planning shifts in such a way as to require a step back and an overall look at our goals and options for achieving them.

This also means that for the development of filing requirements for the next set of individual IRP filings, Commission staff will base the requirements primarily on the PSP adopted in this decision, with updates made where necessary to incorporate key new inputs such as load forecast information from the IEPR, and not a new RSP. On the basis of this PSP (discussed in the next section), Commission staff will develop LSE filing templates, LSE-specific GHG planning targets for the CSP tool, and planning direction for LSEs based on the statewide 38 MMT by 2030 electric sector target adopted in this decision.

As we did with the filing of the last set of individual IRPs, we will ask LSEs to submit plans for how they would achieve their proportionate share of the 38 MMT GHG target adopted later in this decision. But we will also require LSEs to submit plans for how they would reach the 30 MMT GHG target reflected in the RESOLVE sensitivity portfolio. This will provide us with more informed optionality, should we decide to adjust the GHG target downward in the future.

Commission staff will aim to have these materials available no later than May 1, 2022. Individual LSE plans will be due no later than September 1, 2022.

Similar to the current IRP cycle, we will aim to have a PSP adopted on the basis of these individual IRP filings by the end of 2023.

In order to ensure that we have the best information upon which to base the 2023 PSP adoption and subsequent TPP analysis by the CAISO, we will ask the LSEs to include resource planning information out to 2035. This will avoid Commission staff having to conduct additional capacity expansion modeling analysis to fill out the remainder of the ten-year timeframe needed for TPP analysis. This means that each time an individual IRP filing occurs, the LSEs should include at least 12 years of planning information, to the extent it is available, instead of ten years, in order to capture the timeframes needed for TPP purposes, in addition to our purposes.

This approach means that there is unlikely to be a completely new base case portfolio for the CAISO to analyze during the interim year (2023-2024 TPP for the next two-year IRP cycle) that is based on 2022 LSE plans. However, there may be some updates that can be made, based on recent CAISO analysis, CEC IEPR analysis, CARB scoping plan updates, or Commission staff analysis. We will address the nature of the next TPP portfolio(s) later in 2022 and give parties an opportunity to comment on our proposals at that time.

4. Preferred System Portfolio and GHG Target for 2030

On August 17, 2021, an ALJ ruling was issued containing the staff recommendations for the portfolio to be adopted by the Commission and used by the CAISO in the 2022-2023 TPP. This ruling and its attachments detailed the manner in which Commission staff aggregated the individual IRPs and then conducted production cost modeling to evaluate the results of the aggregated portfolio, and whether the portfolio would meet the statewide electric sector 2030

GHG emissions planning targets of 46 MMT and 38 MMT set most recently by the Commission D.21-02-008 for LSE plans; the 46 MMT target was originally adopted in D.18-02-028 and affirmed in D.19-04-040 and D.20-03-028.⁵ This section discusses our determination on the portfolio to be adopted and the associated GHG target.

4.1. Analysis Leading to PSP Portfolio and GHG Target Recommendation

This section summarizes the analysis conducted by Commission staff that led to the recommended PSP portfolio based on a 38 MMT GHG target in 2030. Parties' comments on the steps if the analysis are included in this section, with the discussion of the Commission's determinations addressed in summary fashion after discussing all aspects of the analysis and parties' feedback on it.

4.1.1. Individual IRP Aggregation Analysis

This section of the decision describes the general process Commission staff used to aggregate the portfolios of the individual LSEs filed on September 1, 2020. More detail was contained in the August 17, 2021 ALJ ruling and its attachments.

The individual IRPs all included LSE-specific information on planned GHG reductions, reliability resources, imports and exports, impacts on disadvantaged communities, and estimated costs.

As part of their individual IRPs, all LSEs filed RDTs containing information about the resources they currently use or are planning to use to serve their customer load. LSEs also submitted CSP calculators to estimate the GHG and criteria pollutant emissions of their planned portfolios.

⁵ 46 MMT is equivalent to the 42 MMT target set in D.18-02-018, because it includes certain combined heat and power projects in the electric sector that were previously attributed to the industrial sector.

Contained in the RDTs is information about baseline and existing resources, resources contracted for and in development, and planned resources for which there are no current contracts.

To analyze the RDTs, Commission staff built a tool to aggregate the portfolios and check errors, called the “RDT error checking, aggregation, and reallocation tool” or RECART. RECART performed the following functions: combining the filings into one dataset; producing LSE-specific workbooks that tracked errors; and performing diagnostics for staff to use when analyzing LSE filings. RECART compiled energy and capacity resources under contract, organized by technology type and LSE, and aggregated new resources that were either in development or planned for future purchase.

Commission staff spent considerable time and effort iterating with individual LSEs through up to six re-submission requests from September 2020 through February 2021, to correct and clarify existing and planned contract information provided by the LSEs. This effort ensured that the Commission was working from plans that fully reflect LSE planning and priorities.

Commission staff combined several datasets to create a full list of baseline and planned resources to be online in future years. Those datasets include the following:

- An updated baseline of resources that are online and delivering to CAISO, or are in development with executed and approved contracts, which consists of:
 - The baseline of existing and “in development” resources from the reference system plan (RSP) updated with additional projects that have achieved commercial operation in the CAISO market; and

- Additional contracted resources included in the RDTs with executed and approved contracts as of June 30, 2020;
- Compiled portfolios of new resources, both in development with contracts executed and approved after June 30, 2020 and planned for future development.

Commission staff also quality controlled these datasets through the following processes, to avoid duplication and verify accuracy:

- A comparison of the RSP baseline with the CAISO generator lists showing new resources online since the RSP baseline was compiled, in order to confirm or supplement new development resources;
- Extensive reconciliation and error checking to remove duplicates, correct errors, and validate data sources, such as the Western Electricity Coordinating Council Anchor Data Set.

Commission staff assembled these sources, checked for overlap and double counting, and created one curated list of resources.

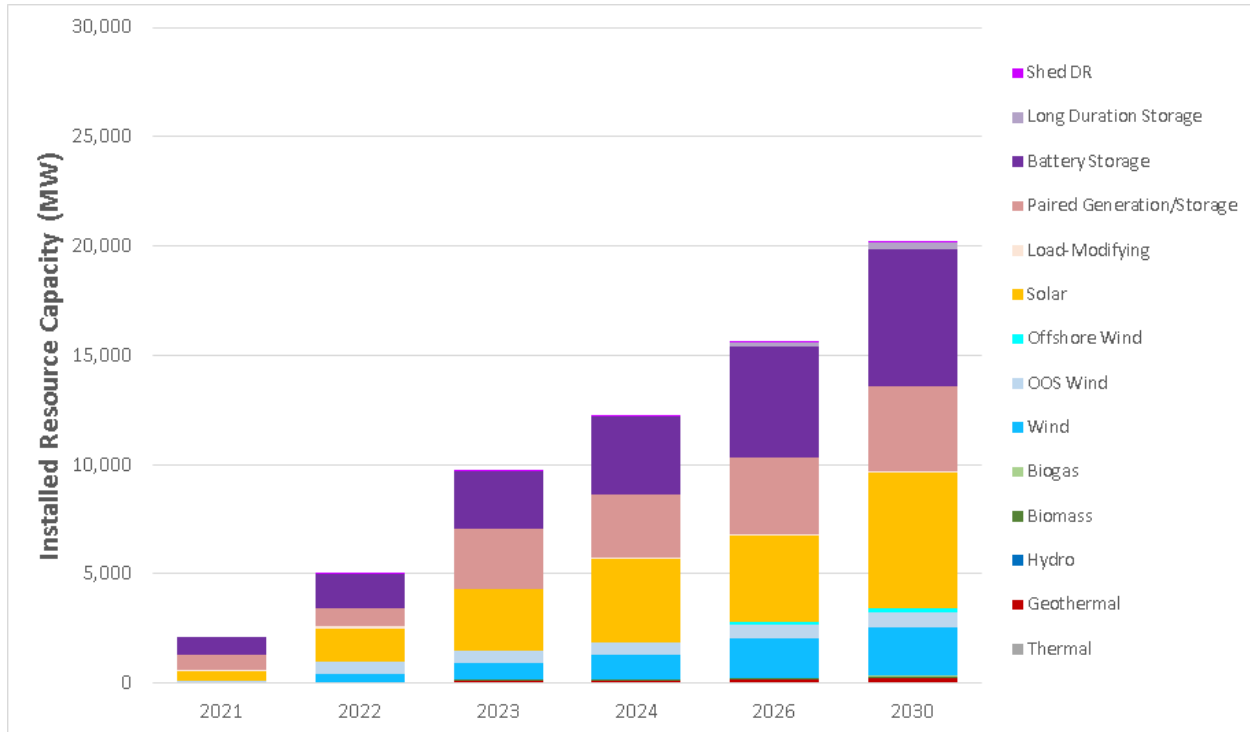
Commission staff also worked with the California Energy Commission (CEC) staff to develop RDTs for publicly-owned utilities (POUs) that are within the CAISO footprint, to reflect existing contracts held by POUs and create an accurate picture of all resource planning across the CAISO.

According to D.20-03-028, LSEs were required to submit plans that met their portion of both the 46 MMT statewide GHG target by 2030, adopted by the Commission in that decision, as well as plans that met their portion of a 38 MMT or lower GHG target.

The aggregated portfolios meeting both the 46 MMT GHG target and the 38 MMT GHG target were then used as the starting point for modeling to develop and recommend the PSP for use in the TPP.

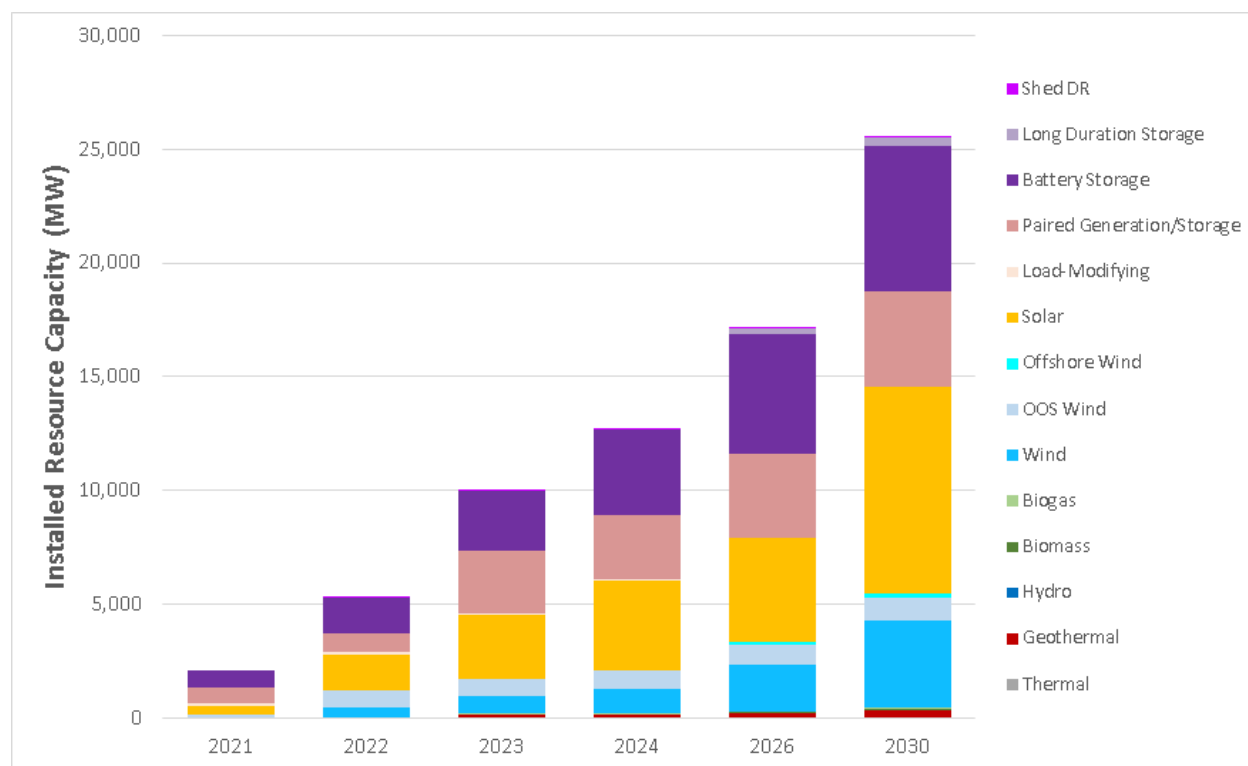
Figures 1 and 2 below show the new resource buildout associated with both the 46 MMT and 38 MMT individual plans of all LSEs. All of these resources are incremental to the updated baseline described above.⁶

Figure 1. New Resource Buildout Associated with the Aggregated 46 MMT Plans



⁶ Paired generation/storage in Figures 1 and 2 below refers to resources that LSEs entered as “New Hybrid” in their RDTs.

Figure 2. New Resource Buildout Associated with Aggregated 38 MMT Plans



The total GHG emissions of the aggregated CSP calculators submitted in LSE plans came in under the targeted GHG emissions amounts. This is because several LSEs submitted plans that achieved emissions levels lower than their individual benchmarks, resulting in a lower aggregated total for the CAISO system as a whole.

The analysis conducted in the RESOLVE model includes assumptions about all CAISO LSEs, including those POUs whose procurement does not fall within the Commission's IRP oversight.

The resource buildout differences between the 46 MMT and 38 MMT portfolios of the LSEs are relatively small between now and 2024 (under 500 megawatts (MW)), exceed 1,000 MW in 2026, and total approximately 5,400 MW by 2030. The additional resources added by LSEs in the second half of

the decade are a mix of resources, including geothermal, wind (including out-of-state (OOS) and offshore wind), solar, paired renewable and storage resources, and battery storage, along with smaller amounts of biomass, biogas, demand response, and long-duration storage.

In general, the portfolio size and composition of the aggregated portfolios are generally consistent with the RSP adopted in D.20-03-028, but they include more resources with higher net qualifying capacity (NQC) than the RSP. The aggregated portfolios include more technology types than the RSP, but the amounts of diverse resources being planned for (*e.g.*, geothermal, long-duration storage, offshore wind, OOS wind, and biomass) are generally smaller than what was recently required by the Commission in the MTR decision (D.21-06-035). LSE plans were also developed prior to D.21-06-035 and thus do not contain the required MTR procurement amounts and attributes.

4.1.1.1. Comments of Parties

Nearly all of the parties commenting on the aggregation analysis generally supported the staff approach. CalCCA sought clarification that planned resources of LSEs would count toward MTR requirements.

PG&E did not voice support, opposing the use of aggregated portfolios for PSP formation, because the LSE Plans did not include resources planned to meet the MTR requirements and did not take into account recent decisions related to the power charge indifference adjustment (PCIA).

GPI shared the concern about disconnection from the MTR decision, but recommended that the current approach is sufficient for this decision, and that future disconnects can be avoided by issuing procurement track decisions based on the RSP.

CEJA and Sierra Club described the general need for future ground-truthing, deep decarbonization, and air quality modeling. In reply comments, Cal Advocates and CESA agreed with the need for ground-truthing, Cal Advocates and NRDC agreed on the need for future air quality and disadvantaged community impact analysis, and GPI would support a SERVM air pollution analysis if it was done on a net lifecycle basis for all resources and not just a smokestack-only analysis.

Numerous other parties also suggested improvements for next cycle's planning and aggregation process, including AWEA, CalWEA, CESA, GPI, Hydrostor, LDESAC, LSA, SEIA, Vote Solar, Ormat, PG&E, SCE, and SDG&E.

In reply comments, CalCCA suggested that the Commission should develop specific and clear reliability planning standards for individual LSE Plan filings that are grounded in the reliability metric that will be used to evaluate the aggregated portfolio's reliability as a whole. PG&E made similar comments. CalCCA also suggested that the Commission formally adopt and finalize all planning standards, inputs, and assumptions at least nine months before the plan filing deadline, and test and finalize all data templates at least three months prior to the filing deadline.

4.1.2. Reliability Analysis of Aggregated LSE Plans

The primary purposes of production cost modeling (PCM) in the IRP proceeding are to ensure that system reliability, operational performance, emissions, and operating costs of a given portfolio are expected to meet IRP requirements and to confirm that expectations of future resource dispatch and operation are supported across a distribution of probable scenarios of weather and resource performance. In particular, PCM is used to ensure that

expectations of reliability and GHG emissions are reasonable, given expected operations of the system across all hours of a year, and not just a snapshot, peak season, or peak time of the day.

To transform LSE plans into inputs for PCM, Commission staff began with the PCM baseline and electric demand inputs used to produce the TPP portfolios sent to the CAISO for their 2021-2022 TPP. Staff updated the baseline resource fleet as described above, then replaced RESOLVE planned capacity with capacity included in the aggregated LSE 46 MMT and 38 MMT portfolios to generate the aggregated LSE plans. Staff used PCM analysis to confirm whether the aggregated LSE plans met the requirements of the commission, namely achieving a reliable electricity system as well as the GHG targets.

Full reliability and GHG analysis through PCM found that the aggregated LSE plans failed to meet reliability targets (Loss of Load Expectation (LOLE) equivalent to 0.1 or less, meaning one or fewer loss of load events in ten years) and GHG targets. Additional capacity was needed on top of the baseline resources and LSE planned procurement to meet the reliability and GHG targets. Neither the 46 MMT nor the 38 MMT aggregated portfolios met reliability targets, although the 46 MMT aggregated portfolios met the GHG target. The 38 MMT portfolio resulted in GHG emissions about 5.5 MMT higher than the target. Table 2 shows the results of PCM analysis of both portfolios, for study years 2026 and 2030, and includes the LOLE and loss-of-load-hours metrics, as well as expected unserved energy (EUE).

Table 1. LOLE Results from Aggregated LSE Plan Portfolios

Reliability Metrics	46MMT 2026	46MMT 2030	38MMT 2026	38MMT 2030
LOLE (expected outage events/year)	0.36	0.68	0.29	0.41
Loss of Load Hours (hours/year)	0.76	1.63	0.61	0.94
LOLH/LOLE (hours/event)	2.09	2.38	2.07	2.26
Expected Unserved Energy (MWh)	1,436.66	2,468.93	1,176.91	1,364.54
Annual load (MWh)	255,116,344	265,501,285	255,094,310	258,290,192
Normalized EUE (%)	5.631E-06	9.299E-06	4.614E-06	5.283E-06

The aggregated LSE plan portfolios failed to meet GHG and LOLE targets due to insufficient new capacity. The GHG results contrast with the GHG results from the aggregated CSP calculators submitted by LSEs, which may indicate an over-reliance on existing resources by some LSEs, to the extent that LSEs combined are planning for more existing resources than actually exist in the baseline. Overall, the aggregated LSE plan portfolios were insufficient to meet reliability and GHG requirements.

4.1.2.1. Comments of Parties

There were several themes in parties' comments on the reliability analysis of the aggregated plans. First, several parties felt that staff should provide more information to parties about why the aggregated portfolio was not reliable. In particular, SCE and Cal Advocates wanted to use the analysis to help LSEs improve the design of their plans in the next round of IRP. CCSF speculated that the LSE plans were not reliable because LOLE modeling targeted a higher PRM than the LSEs did in their plans.

Middle River, NRDC, and SDG&E specifically commented in support of testing the LSE plans first for reliability and then using RESOLVE to add additional capacity.

PG&E, TURN, and Cal Advocates recommended studying operational conditions and off-peak hours to make sure needs are met for operations, not just capacity. Ormat recommended development of resources for baseload needs as well as peaking dispatchable needs.

CalCCA and Cal Advocates requested that staff continue to study results to ensure that EUE outputs are robust, as well as to explain why differences persist in GHG emissions between RESOLVE and SERVIM. PG&E recommended additional analysis for operational reliability and locational resource needs, while SCE recommended using the 2020 IEPR assumptions with the high EV forecast as the basis for the analysis.

4.1.3. Capacity Expansion Modeling to Augment LSE Plans

As articulated in D.20-03-028, Commission staff's analysis of the aggregated LSE plans assumed that a 38 MMT target was a reasonable goal to set in the PSP that would benefit from further analysis based on actual procurement planning by LSEs. The Commission further articulated in D.21-06-035 that a 38 MMT GHG limit for 2030 should be adopted as the PSP, as long as the resource mix resulted in a system with a 0.1 LOLE or less. Therefore, Commission staff began by subjecting the 38 MMT aggregated plan to additional capacity expansion modeling and production cost modeling.

Since the aggregated 38 MMT LSE plans portfolio failed to meet GHG and LOLE requirements through 2030, additional capacity was required to bring the portfolio into compliance with IRP requirements. Commission staff utilized the

RESOLVE model to conduct additional analysis to determine what resources may be needed to supplement the resources contained in the aggregated 38 MMT LSE plan portfolios.

Most parties are familiar with the RESOLVE model because it is the capacity expansion model that has been used since the first IRP cycle to form the RSP and/or PSP adopted by the Commission. Before being used in this round of analysis, several updates were made to the model, as described below. Many of these updates are important for and related to transmission constraints that affect the TPP analysis that will be conducted by the CAISO in its 2022-2023 TPP. Updates included the following (*see* the August 17, 2021 ALJ ruling and Attachment A for more details on RESOLVE updates):

- Code base was updated overall;
- Lithium-ion battery and pumped storage are now modeled by multiple resources (rather than single CAISO-wide resources) so they can be included in deliverability constraints;
- Transmission upgrade limits were enforced to limit transmission build to CAISO-determined levels;
- Solar resources were consolidated to align with battery locations as a step towards representing co-located and paired resources and to make incorporation of storage resources easier;
- New CAISO deliverability data was incorporated for peak and off-peak resources, with updated transmission constraints, and resource-specific output factors;
- OOS wind on new transmission and offshore wind were updated to be fully deliverable;
- Wind-transmission interactions for Wyoming and New Mexico wind imports were constrained based on CAISO revised transmission limits;

- Resource costs were updated to the latest data vintage of standard IRP data sources; and
- Federal production tax credit (PTC) and investment tax credit (ITC) schedules were updated to reflect statutory and Internal Revenue Service guidance as of December 2020 and the solar annual build constraints were updated to reflect the updated ITC schedule.

Once these updates were completed, Commission staff used the RESOLVE model to construct additional scenarios that could be potential candidates for a PSP that meets the reliability and emissions standards, to be considered further by the Commission.

As a preliminary matter, to be utilized by the CAISO in the TPP process, the portfolio needs to address a ten-year planning horizon, which for the 2022-2023 TPP means planning through 2032. The individual IRPs were only required to identify resources through 2030, so RESOLVE was used to select additional resources for the remaining two years to round out the ten-year planning timeframe.

A GHG target for 2032 was assigned by analyzing additional modeling study years in RESOLVE of 2035, 2040, and 2045, and then interpolating a GHG target for 2032 using those additional years plus 2030.

In addition, because the MTR decision (D.21-06-035) was adopted after the filing of the individual IRPs, Commission staff added the required resources or resource attributes, as applicable, from the 11,500 MW of NQC ordered in that decision as a component of the portfolios. We note in response to comments filed by CalCCA that LSE planned resources were counted toward the MTR requirements in this process. RESOLVE was used here to select additional resources above and beyond LSE plans to meet any remaining MTR procurement need.

The impact of the MTR decision was implemented with a number of changes in the RESOLVE modeling. First, the planning reserve margin (PRM) was aligned with the 2024 “high need” scenario adopted in D.21-06-035, which uses a PRM of 22.5 percent. Load adders were also added to account for the managed mid-demand peak impact of the 2020 CEC Integrated Energy Policy Report (IEPR) demand forecast (instead of 2019) and the high electrification scenario (instead of the mid-demand). Additional thermal generation retirements were also applied, for units over 40 years in age. The unspecified import assumption was reduced from 5,000 MW to 4,000 MW. In 2028, 1,000 MW NQC of geothermal and 1,000 MW NQC of long-duration storage were forced into the portfolio as a proxy for the 2,000 MW of long lead-time (LLT) resources required in D.21-06-035. These assumptions were left in the model to persist after 2026.

After augmenting the aggregated portfolios submitted by the LSEs on September 1, 2020 with the additional two years of resources and the MTR requirements, Commission staff analyzed the following scenarios in RESOLVE. Unless otherwise noted, all scenarios utilized the demand forecast⁷ from the CEC’s 2019 IEPR:

- A 38 MMT GHG target in 2030 without LSE plans included; this is essentially a re-run of a reference system portfolio with updated assumptions, and is intended for comparison purposes only;
- A 38 MMT GHG target in 2030 with LSE plans incorporated, along with the MTR resources of 11,500 MW,

⁷ The particular forecast utilized was the IEPR mid-demand, mid-additional achievable energy efficiency (AAEE), as agreed upon between the Commission, the CEC, and the CAISO as the “single forecast set” basis established in a 2010 memorandum of understanding, for comparable analysis by each agency.

and resource augmentation for 2031 and 2032 (referred to as the “38 MMT Core Portfolio”);

- Several 38 MMT GHG target sensitivities built off of the 38 MMT Core Portfolio, as follows:
 - 38 MMT Core with the 2020 IEPR managed mid-demand forecast;
 - 38 MMT Core with the 2020 IEPR managed mid-demand forecast mixed with the 2020 IEPR high electric vehicle (EV) demand forecast;
 - 38 MMT Core with a high electrification demand forecast for both price responsive and non-price-responsive EV profiles, based on a high electrification demand scenario developed by Commission staff using the PATHWAYS model in 2020 for modeling purposes;
 - 38 MMT Core with an assumption that developers do not invest to a level significant enough by end of 2025 to access safe harbor provisions of the offshore wind ITC, making projects ineligible for the full ITC benefits;
 - 38 MMT Core with high solar and battery storage cost assumptions; and
 - 38 MMT Core with MTR non-persistence assumption to test portfolio changes if the MTR “high need” scenario reliability drivers are reduced similar to the previously-established IRP planning assumptions.
- A 46 MMT GHG target in 2030, based on LSE plans and augmented with the 11,500 MW of MTR NQC and 2031 and 2032 resources (referred to as the “46 MMT Core Portfolio”);
- A 30 MMT GHG target in 2030, based on the LSE plans designed to achieve the 38 MMT target, augmented with the 11,500 MW of MTR NQC, 2031 and 2032 resources, and additional resources necessary to achieve the lower 30 MMT GHG target (referred to as the “30 MMT Core Portfolio”); and

- 30 MMT Core with a high electrification demand forecast, based on a high electrification demand scenario developed by Commission staff using the PATHWAYS model in 2020 for modeling purposes.

Attachments to the August 17, 2021 ALJ ruling provide the detailed results of the major scenarios studied. Figure 3 and Table 3 below summarize the resource buildout results for the 38 MMT Core scenario. By 2030, RESOLVE's 38 MMT Core results indicate that all reliability and GHG constraints are largely being met through a combination of aggregated LSE planned resources and the additional resources required in D.21-06-035. The only additional RESOLVE-selected resources being selected above and beyond LSE plans and D.21-06-035 requirements in 2030 are 286 MW of utility-scale solar to meet the GHG target. After 2030, because LSEs were not asked to plan beyond 2030, all additional resources were selected by RESOLVE.

Figure 3. New Resource Buildout of 38 MMT Core (cumulative MW)

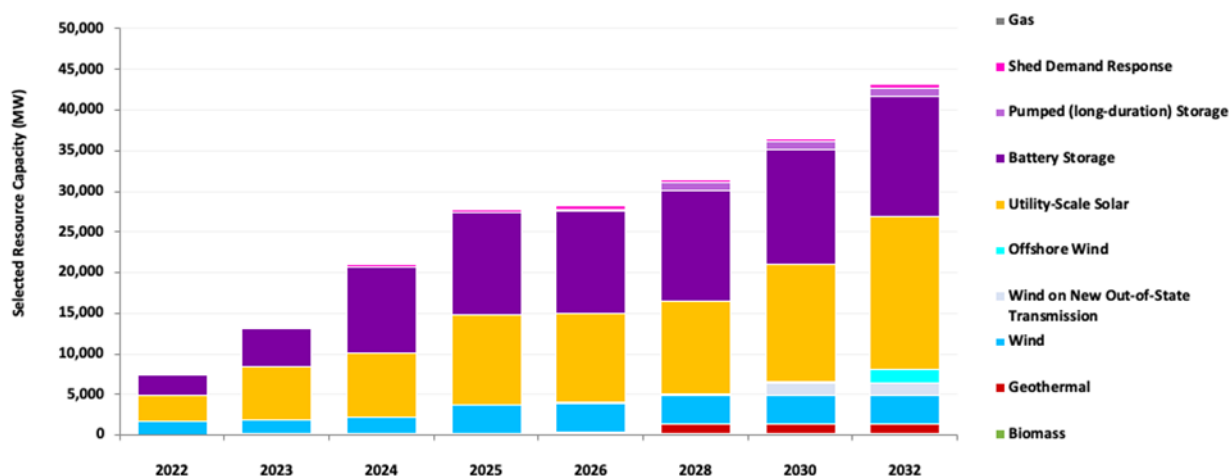
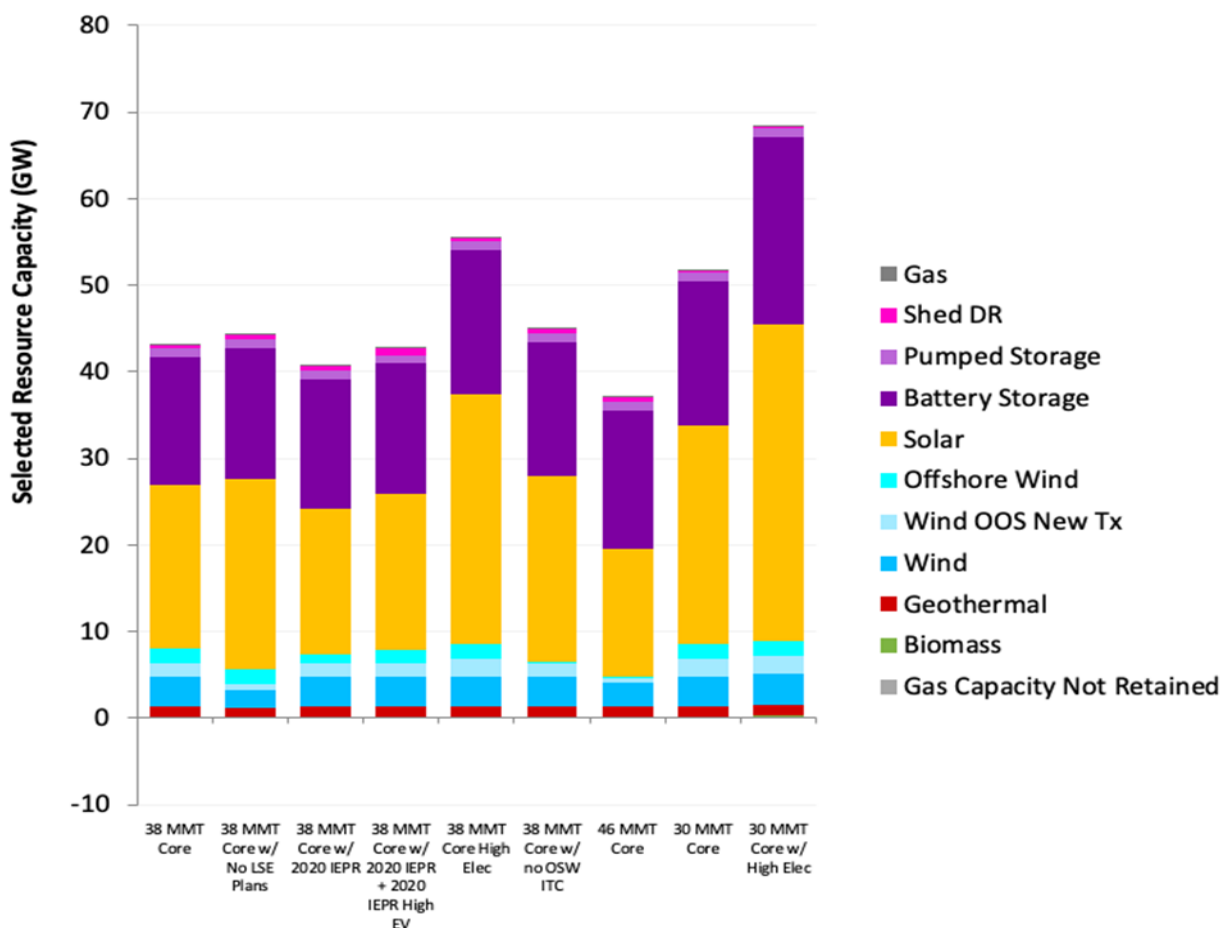


Table 2. New Resource Buildout of 38 MMT Core (Cumulative MW)

Resource Type	2022	2023	2024	2025	2026	2028	2030	2032
Gas	-	-	-	-	-	1	1	1
Biomass	34	65	83	107	107	134	134	134
Geothermal	14	114	114	114	184	1,160	1,160	1,160
Wind	1,719	1,741	2,071	3,553	3,553	3,553	3,553	3,553
Wind on New Out-of-State Transmission	-	-	-	-	0	0	1,500	1,500
Offshore Wind	-	-	-	-	120	195	195	1,708
Utility-Scale Solar	3,094	6,549	7,750	11,000	11,000	11,397	14,457	18,883
Battery Storage	2,565	4,604	10,617	12,553	12,553	13,609	14,086	14,751
Pumped (long-duration) Storage	-	-	-	-	196	1,000	1,000	1,000
Shed Demand Response	151	151	353	441	441	441	441	441
Total	7,577	13,224	20,988	27,768	28,154	31,489	36,527	43,131

Figure 4 below shows the resource buildout differences in various sensitivity scenarios.

Figure 4. Summary of New Resource Buildout in Sensitivity Scenarios in 2032 (Cumulative MW)



Key resource buildout differences by 2032 in the sensitivity scenarios compared to the 38 MMT Core scenario include:

- For the 38 MMT Core without LSE plans, an additional 1,161 MW due largely to more solar and battery storage capacity, and less in-state wind and OOS wind on new transmission capacity;
- For the 38 MMT Core using the 2020 IEPR mid demand forecast, 2,385 MW of fewer resources due to less solar and

offshore wind capacity and slightly more capacity from battery storage and shed demand response;

- For the 38 MMT Core using the 2020 IEPR mid with High EVs, 1,452 MW of fewer resources due to slightly less capacity from solar, battery storage, and shed demand response;
- For the 38 MMT Core with high electrification with managed EV portfolio, an additional 12,374 MW due to more capacity from solar, OOS wind on new transmission, and battery storage capacity;
- For the 38 MMT Core without the offshore wind ITC, and additional 1,767 MW due to more solar and battery storage capacity, and less offshore wind capacity;
- For the 46 MMT Core, 6,141 MW of fewer resources due to less solar, in-state wind, out-of-state wind on new transmission, and offshore wind capacity, and more capacity from battery storage;
- For the 30 MMT Core, an additional 8,551 MW due largely to more solar, out-of-state wind on new transmission, and battery storage capacity, as well as slightly less shed demand response capacity; and
- For the 30 MMT Core with high electrification, an additional 25,237 MW due largely to more solar and battery storage capacity, and to a lesser extent more in-state wind, out-of-state wind on new transmission, and biomass capacity, as well as slightly less shed demand response capacity.

Table 4 below identifies several key cost metrics associated with the 38 MMT Core scenario and other sensitivities described in the August 17, 2021 ALJ ruling.

Table 3. Scenario Cost Metrics

Scenario	Revenue Req't (\$MM in Present Value)	Total Resource Cost (\$MM in Present Value)	Levelized Revenue Req't (\$MM)	Levelized Total Resource Cost (\$MM)	Levelized Average Rate (cts/kWh)
38 MMT Core	\$ 844,337	\$ 905,213	\$ 45,527	\$ 48,809	19.3
38 MMT Core w/ No LSE Plans	\$ 841,125	\$ 902,002	\$ 45,354	\$ 48,636	19.2
38 MMT Core w/ 2020 IEPR	\$ 839,282	\$ 902,413	\$ 45,254	\$ 48,658	19.5
38 MMT Core w/ 2020 IEPR + 2020 IEPR High EV	\$ 842,737	\$ 905,868	\$ 45,441	\$ 48,845	19.4
38 MMT Core High Elec	\$ 914,689	\$ 973,062	\$ 49,320	\$ 52,468	18.6
38 MMT Core w/ no OSW ITC	\$ 845,109	\$ 905,986	\$ 45,569	\$ 48,851	19.3
46 MMT Core	\$ 843,816	\$ 904,692	\$ 45,499	\$ 48,781	19.3
30 MMT Core	\$ 845,925	\$ 906,802	\$ 45,612	\$ 48,895	19.3
30 MMT Core w/ High Elec	\$ 916,174	\$ 974,547	\$ 49,400	\$ 52,548	18.6

4.1.3.1. Comments of Parties

Many parties filing comments on the capacity expansion modeling focused their comments on requests for additional sensitivities to be run. CalWEA, CUE, NRDC, and TURN asked for more sensitivities incorporating behind-the-meter (BTM) solar. Cal Advocates, CEJA, and Sierra Club supported this concept in reply comments.

DOW and LDESAC asked that a full set of sensitivities be run on the 30 MMT GHG scenario. Cal Advocates requested a 46 MMT IEPR High EV

scenario to more fully show transportation and electric sector GHG reduction cost-effectiveness.

CORD requested a sensitivity considering the geographical diversity of resources and the associated wildfire risks of both transmission and renewable development projects.

Several parties wanted to see analysis of a scenario that represented reduced reliance on fossil-fueled generation, with at least 3-4 GW of fossil-fueled generation retired by 2032 and a focus on air quality impacts. These parties included CEJA, Sierra Club, Western Grid, and Hydrostor. CEJA and Sierra Club specifically sought a “real cost of gas” scenario with higher gas costs, while Calpine opposed this idea in reply comments since it implies that the current gas costs being used are invalid.

Ormat sought additional geothermal sensitivities to show the value of different attributes. GPI recommended more baseload renewable sensitivities with iteratively more renewable baseload resources forced in to assess system reliability, cost, and GHG emissions impacts.

PCF sought a “high distributed resource future” scenario, which would be a 30 MMT sensitivity that replaces utility-scale solar with distributed solar and replaces utility-scale batteries with large-scale batteries at all substations on the distribution grid.

Finally, several parties suggested running one or more sensitivities to evaluate tax policies now under consideration in Congress, including CalWEA, LSA, SEIA, Vote Solar, and OWC.

Other parties suggested sensitivities aimed at specific themes. CEJA and Sierra Club wanted scenarios to reflect the 2045 carbon neutrality goal.

CESA and PG&E suggested additional analysis to reflect alignment with the MTR decision. CalCCA, CCSF, and GPI suggested running different sensitivities adjusting the planning reserve margin (PRM).

Finally, several parties had specific suggestions for changes to the inputs and assumptions around vehicle-to-grid options (CCE), Nevada geothermal (GridLiance), transmission capability in Southern Nevada (GridLiance), long-duration storages (Hydrostor, Wartsila), Idaho wind capacity factors (LS Power), effective load carrying capacity (ELCC) values for MTR (PG&E), hydrogen blending (Diamond), enhanced geothermal (Ormat), and hybrid gas and storage (CESA, Middle River).

4.1.4. Reliability Analysis of the 38 MMT Core Scenario

The aggregated LSE Plans portfolios, supplemented with RESOLVE portfolios, on top of the baseline resources, produced a portfolio of resources for the 46 MMT Core and 38 MMT Core scenarios, as well as several sensitivity cases. Commission staff focused on the 38 MMT Core portfolio and incorporated it into SERVIM for further analysis. The process for translating RESOLVE portfolios for PCM analysis was performed in steps and then validated by comparison between RESOLVE and PCM results.

PCM results confirmed that the 38 MMT Core portfolio meets LOLE and GHG targets in 2026 and 2030. Commission staff conducted additional modeling in the 2026 study case in order to determine the effect of the required timelines adopted in D21-06-035, specifically around potential delays in developing LLT resources between 2026 and 2028, as provided for in that decision. Table 5 below demonstrates that the 38 MMT Core case achieves LOLE targets and is very close to the GHG targets for the CAISO area (31.1 MMT pro-rated for CAISO only).

**Table 4. SERVVM Analysis of 38 MMT Core Portfolio:
Emissions and Reliability Results**

Reliability and GHG Metrics	38MMT 2026	38 MMT 2030
LOLE (expected outage events/year)	0.064	0.054
LOLH (hours/year)	0.21	0.15
LOLH/LOLE (hours/event)	1.76	1.72
EUE (MWh)	292.28	187.45
Annual load (MWh)	255,345,985	265,753,062
normalized EUE (%)	1.145E-06	7.054E-07
GHG (MMT)	38.14	34.67

PCM analysis demonstrated that the 38 MMT Core portfolio is reliable in 2026 and 2030.

4.1.4.1. Comments of Parties

Approximately three quarters of parties supported or had no comment on the 38 MMT Core as the PSP and staff's LOLE modeling showing it as reliable. The majority of parties ask the Commission to adopt the portfolio and ensure that procurement happens.

PCF recommended using a lower PRM and removing import restrictions used to establish the PSP. CAISO studied the 38 MMT Core portfolio using both stochastic and deterministic PCM and their results showed that it only provides about 500 MW of effective capacity above the level necessary to meet the 0.1 LOLE in 2026. SCE noted in reply comments that CAISO seems to have used a different approach to simulate the stochastic load profiles than the method used by Commission staff, the CEC, and SCE. Moving forward, SCE argued that it is critical that all parties' models are based on the same reliability metrics specified by the Commission and follow similar processes to model uncertainties in their

reliability assessments. AReM argued that the CAISO's modeling should be given no weight because they provide almost no description of its assumptions.

A number of parties also commented on the higher PRM assumptions and the MTR order, with some characterizing it as excessively reliable and not supported by an LOLE study. These parties include PG&E, SCE, and AReM. SCE claims that their modeling shows there is no loss of load with MTR capacity and staff's recommended RESOLVE portfolio.

TURN recommended that staff continue to evaluate the correct PRM with LOLE modeling. Several parties also agreed with SCE's suggestion for more iterative LOLE and PRM modeling in a separate track of the proceeding, including CalCCA, CalWEA, CCSF, CESA, IEP, Middle River, and PG&E.

Cal Advocates recommended, given modeling discrepancies among Commission staff, PG&E, and SCE, that the 38 MMT Core portfolio be rerun using the 2020 IEPR load forecast, and then closely examining the energy storage procurement levels, operations, and integration of renewables.

Finally, CEJA and Sierra Club, and EDF in reply comments, requested a SERVIM run for the 30 MMT high electrification scenario, which they argued would facilitate the use of the 30 MMT limit in future analyses.

4.1.5. Proposed Preferred System Portfolio and 2030 GHG Target

Based on the reliability and GHG results of the SERVIM analysis conducted on the 38 MMT Core Portfolio, the August 17, 2021 ALJ ruling recommended that the 38 MMT Core Portfolio be adopted by the Commission as the PSP. The 38 MMT Core Portfolio, by 2032, includes the equivalent of 74 percent RPS resources and 87 percent GHG-free resources in compliance with Senate Bill (SB) 100 (Stats. 2018, Ch. 312) goals.

The practical implications of the 38 MMT Core portfolio being adopted as the PSP are several:

- 38 MMT will become the new GHG limit adopted by the Commission for GHG emissions from the electricity sector in 2030. Thus, individual LSEs will, for at least the next cycle of IRP, be required to meet their individual proportional benchmarks associated with this overall electric sector limit on GHG emissions.
- The 38 MMT Core Portfolio will be mapped to transmission busbars for use by the CAISO as the reliability base case in its TPP beginning with the 2022-2023 cycle.
- Any resources associated with the PSP, or resource attributes thereof, will be expected to be developed by the LSEs. Their procurement will need to match their emissions and reliability responsibilities associated with the PSP by 2030 and in the interim years.
- Any transmission identified by the CAISO as needed to deliver the resources contained in the PSP, within the CAISO footprint, will be assumed to be built and paid for by all ratepayers out of the transmission access charge (TAC).

The August 17, 2021 ALJ ruling also suggested that the Commission strongly consider adoption of the 38 MMT Core scenario with 2020 IEPR assumptions and the 2020 IEPR high EV demand forecast. Not only would this scenario conform with the latest IEPR, but it would also move IRP toward planning for a higher electrification future, which may be prudent given the importance of electrification for meeting the state's climate goals. At the time of the August 17, 2021 ALJ ruling, this scenario had not yet been fully analyzed for reliability in SERVIM.

4.1.5.1. Comments of Parties

At least thirty parties supported setting a 38 MMT GHG target as the basis for the PSP. These included AWEA, AEE, AReM, BAC, Breakthrough, CalCCA, Calpine, CalWEA, CCE, CCSF, CEJA, Sierra Club, CESA, CGNP, EDF, GridLiance, GPI, GSCE, Hydrostor, IDP, LS Power, LSA, SEIA, Vote Solar, Middle River, NRDC, Ormat, Cal Advocates, Pattern, SWPG, PG&E, SCE, SDG&E, and UCS.

Around half of these parties also supported adopting the 38 MMT Core portfolio as the PSP, including AWEA, AEE, CalWEA, CCE, CEJA, Sierra Club, EDF, GridLiance, LS Power, LSA, SEIA, Vote Solar, NRDC, Ormat, SDG&E, and UCS.

GridLiance, LDESAC, LSA, SEIA, and Vote Solar would support a lower GHG target or a higher electrification load forecast. AWEA, AEE, NRDC, CCSF, Cal Advocates and UCS want the Commission to consider lowering the target in the next IRP cycle, with CEJA, Sierra Club, EDF, and Hydrostor asking us to commit to the lower target in the next cycle now.

IEP supported the 38 MMT Core in opening comments but changed their position in replies because they were persuaded by other parties that maintaining the PRM would result in excessive procurement.

Several parties support the 38 MMT Core portfolio as the basis for the PSP, but with modifications. Breakthrough and CGNP support adding additional nuclear power in the portfolio.

AReM, Calpine, CCSF, GPI, and Middle River argued that a lower PRM assumption is warranted. CEJA and Sierra Club disagreed, because more resources will be needed for lower emissions and phasing out of fossil fuels in the future.

Hydrostor, CESA, and LDESAC argued that the 38 MMT Core portfolio should have the previous RSP levels of long-duration storage added back into the portfolio.

Cal Advocates argued for the 2020 IEPR forecast with out-of-state resources on new transmission replaced by in-CAISO resources. Pattern and SWPG, on the other hand, argued for more out-of-state wind in the portfolio.

Some parties preferred a 38 MMT portfolio, but not the core portfolio. CalCCA and CESA argued for the non-persistence 38 MMT portfolio, CESA also wanted the high EV forecast with unmanaged charging, while GSCE argued for the high electrification forecast from the 2020 IEPR.

Some parties also submitted customized portfolios in their comments. SCE included a 38 MMT portfolio with 2020 IEPR assumptions and 3,500 MW less battery capacity than the core portfolio. PG&E customized a 38 MMT portfolio with less capacity. Calpine and Middle River, in reply comments, agreed with the idea of approving a PSP with less capacity included. LSA, SEIA, and Vote Solar, on the other hand, recommended that SCE's proposal be rejected because of modeling differences that need to be examined and because higher load in the future may necessitate more resources in the portfolio.

Finally, some parties supported using the 30 MMT portfolio as the PSP including CEERT, CEJA, Sierra Club, Western Grid, DOW, LDESAC, and PCF. PCF argued that the cost differential between the scenarios is small and the social cost of carbon is high and unaccounted for in the analysis. Western Grid would add additional fossil-fueled generation in the neighborhood of 3-4 GW.

In reply comments, IEP opposed the 30 MMT target as a basis for the PSP because the electric sector is a small share of statewide emissions and a higher target will still lead the sector to the 2045 goals. SCE noted in reply comments

that it had supported 30 MMT as the target in the past, but now fears that 2030 is becoming too close in time and presents significant challenges to reach a lower target, given the transmission infrastructure and additional resources needed to be developed in a short period of time.

The majority of parties also supported adjusting the load forecast assumptions to include higher load, particularly related to EV adoption and high electrification more broadly. Many parties, including AWEA, CalCCA, and CEJA, supported including even higher load than the IEPR High EV forecast, referring to the 2035 zero-emissions vehicle (ZEV) goal, carbon neutrality goals, and numerous executive orders of the Governor and previous Governor.

PG&E also stated that all of the IEPR scenarios materially underestimate the likely EV load by 2030, and UCS recommended including 7 million ZEVs by 2030.

Hydrostor commented that utilizing the IEPR High EV forecast would be the least regrets course of action. SDG&E pointed out that this approach would be consistent with action in the distribution resource plans. SCE asked for production cost modeling of the higher-load scenario.

A few parties opposed this scenario, including Calpine and GPI, arguing that this case could lead to a high amount of over-capacity or over-procurement. CCE argued that while higher electrification may materialize, the needs may not necessarily need to be met only by utility resources, and instead could be at least partially met through distributed resources and vehicle-to-grid capabilities.

Finally, Shell argued that ESP load forecasts should not be adjusted to reflect EV adoption, building decarbonization, or other increased load of customer facilities.

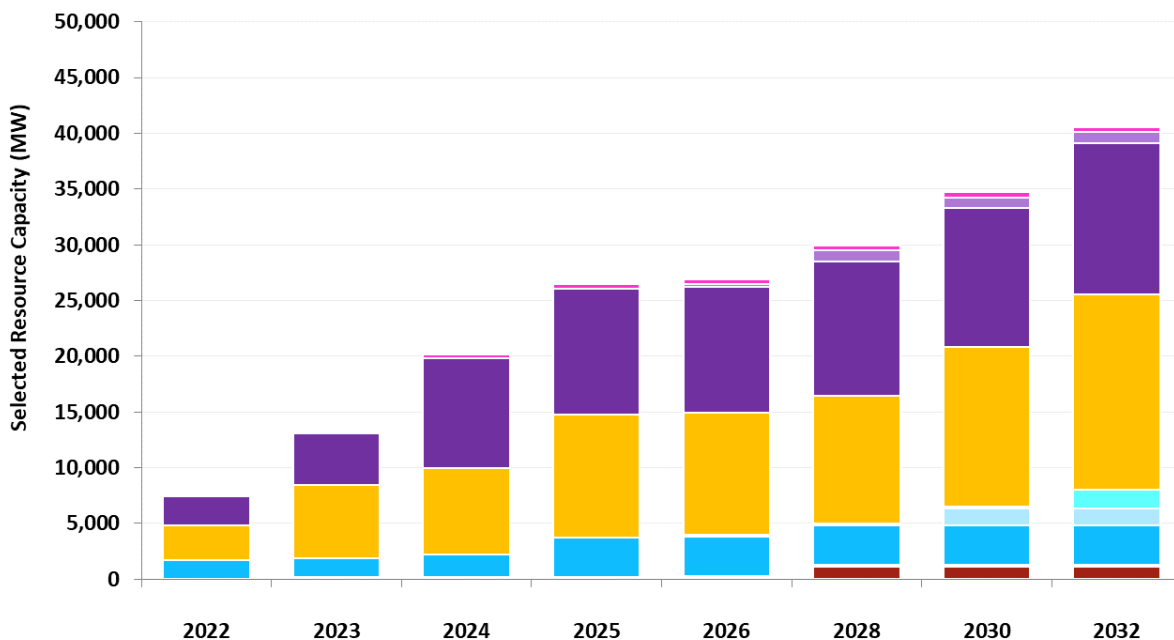
4.2. Discussion

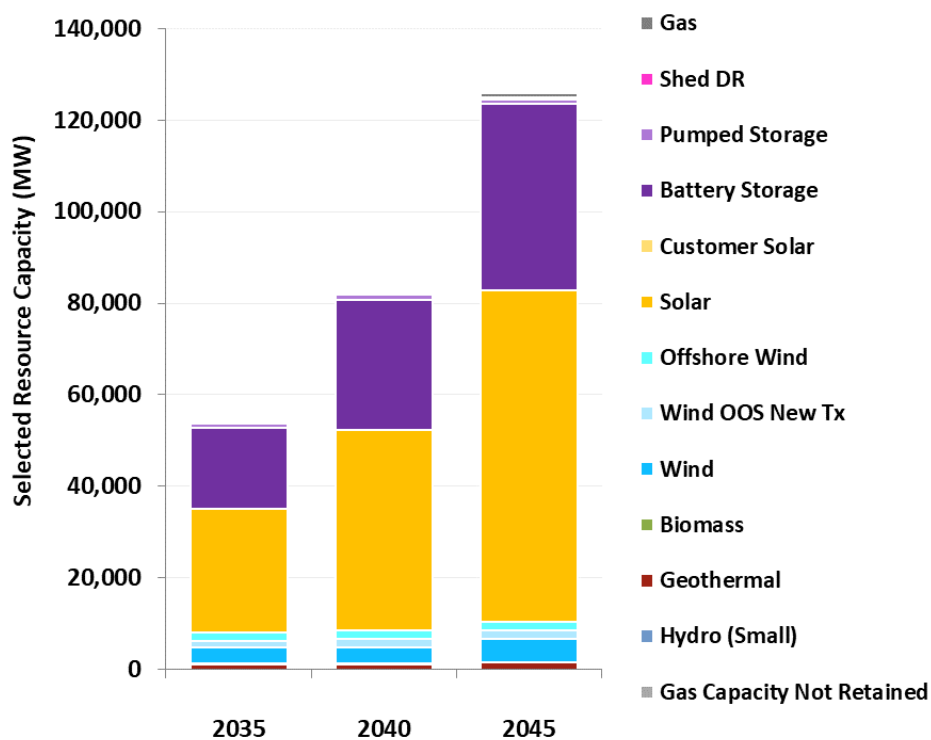
In keeping with the Commission direction in D.21-02-008 and D.21-06-035, and the preferences of the majority of parties, Commission staff focused on further analysis of the 38 MMT Core portfolio for the development of this decision.

In preparation for this decision, Commission staff conducted further analysis of the 38 MMT Core portfolio, updated with the 2020 IEPR managed mid-demand forecast, but using the High EV penetration assumption instead of the mid EV assumption, in both RESOLVE and SERVM. The 38 MMT Core portfolio was first updated in RESOLVE using the new assumptions.

The resulting portfolio of new resources is shown in Figure 5 and Table 6 below.

Figure 5. 38 MMT Core with 2020 IEPR Demand and High EV Penetration





**Table 5. New Resource Buildout of
38 MMT Core (Cumulative MW)**

Resource Type	2022	2023	2024	2025	2026	2028	2030	2032
Gas	-	-	-	-	-	-	-	-
Biomass	34	65	83	107	107	134	134	134
Geothermal	14	114	114	114	184	1,160	1,160	1,160
Wind	1,697	1,719	2,049	3,531	3,531	3,531	3,531	3,531
Wind on New Out-of-State Transmission	-	-	-	-	-	-	1,500	1,500
Offshore Wind	-	-	-	-	120	195	195	1,708
Utility-Scale Solar	3,094	6,549	7,750	11,000	11,000	11,397	14,342	17,506
Battery Storage	2,565	4,604	9,811	11,317	11,317	12,078	12,395	13,571
Pumped (long-duration) Storage	-	-	-	-	196	1,000	1,000	1,000
Shed Demand Response	151	151	353	441	441	441	441	441
Total	7,555	13,202	20,161	26,511	26,897	29,937	34,698	40,551

Notably, the resources selected by RESOLVE between 2030 and 2032, which is the period beyond the planning horizon of the current LSE plans, include an additional approximately 3.2 GW of solar photovoltaics, 1.2 GW of battery storage, and 1.7 GW of offshore wind.

All of the natural gas resources are retained through 2045, with an additional 0.9 GW needed by 2045 to meet reliability requirements.

After developing the full portfolio utilizing the individual IRPs, augmented as described above in RESOLVE, Commission staff conducted additional reliability modeling of the portfolio in SERVVM to ensure its viability.

To conduct the reliability analysis, SERVVM was updated with the same 2020 IEPR demand forecast, paired with the high EV demand assumption. The new RESOLVE-developed portfolio was input into SERVVM as well.

In addition, Commission staff updated SERVVM to simulate storage in a more realistic manner, as follows:

- Set each of the four modeled regions within the CAISO region to be required to maintain their own operating reserves and not share across the CAISO region;
- Retired older 360 MW of combined heat and power (CHP) units in 2032, consistent with RESOLVE's assumption of CHP generation declining linearly from 2030-2040;
- Added a 5 percent average outage rate to all storage categories (batteries, both paired and stand-alone, behind-the-meter batteries, and pumped storage);
- Added a 90 percent discharge cap to batteries, both paired and stand-alone (but not pumped storage since it is a different technology);
- The cap only applies when hourly generation is sufficient to meet demand and required reserves. The cap is ignored if loss-of-load is imminent. The cap is designed to reflect real-world observations in the

CAISO market that storage usually does not fully discharge because frequent complete discharging incurs higher battery maintenance costs;

- Increased the storage price that controls when storage dispatch would override its economic dispatch schedule. In all previous SERVVM analysis, this price was set too low and storage was frequently used for energy arbitrage during lower demand hours, rather than staying optimized to discharge during peak demand hours.

The storage outage rate and discharge cap are modeled only in SERVVM, not in RESOLVE. Commission staff expects to align these storage constraints in the models in 2022.

Also in 2022, Commission staff expects to consider several changes to take into account more recent impacts of climate change on California. These include potential changes to assumptions around the availability of hydroelectric energy, the availability of imported power, and the impact of weather changes in recent years. When implemented in SERVVM, these assumption changes will likely result in higher LOLE numbers than before.

The results of the updated SERVVM analysis for this year's recommended PSP portfolio are shown in Table 7 below.

**Table 6. SERVVM Analysis of Updated PSP Portfolio:
Emissions and Reliability Results**

Category	2026	2030	2032
LOLE capacity (expected events/year)	0.0023	0.0005	0.0006
LOLH (expected hours of events/year)	0.0037	0.0005	0.0009
EUE (MWh)	2.09	0.03	0.65
Annual Load (GWh)	255,308	265,045	272,540
Normalized EUE (%)	0.0000008%	0.0000000%	0.0000002%
GHG emissions (MMT)	36.5	32.5	31.0

The results show very low values for the reliability metrics, which means that the portfolio as modeled is very reliable, with LOLE results well under the Commission's 0.1 target. The original 38 MMT Core Portfolio LOLE results described in the August 17, 2021 ALJ ruling were just under 0.1 LOLE. The very small LOLE results here are primarily due to the storage price variable change described above. When the price was too low, storage frequently did not have sufficient charge to meet peak demand hours. When the price was set to an appropriately high value, storage rarely deviated from SERVVM's economic schedule, which is also the optimal schedule to meet hourly peak demand. The net effect is significant reduction in LOLE.

The results show CAISO area 2030 GHG emissions to be 32.5 MMT, which is 1.4 MMT higher than the RESOLVE output for the same case. This is within the range of difference observed in all previous SERVVM results that were compared to its equivalent RESOLVE result in prior IRP analyses. The differences between RESOLVE and SERVVM modeled GHG emissions in 2026 and 2030 also within this range of difference. Two model differences that contribute to the GHG emissions results difference between the models are:

- SERVVM's 20-year historical year average wind capacity factor is lower than RESOLVE's three-year historical year average, so wind generation in SERVVM is less than in RESOLVE for the same installed capacity;
- SERVVM imposed a storage discharge cap that tends to limit the amount of solar generation that can be stored for use during the evening peak. With the cap in place, curtailment, imports, and exports increased while storage round-trip losses decreased. In-state gas generation stayed about the same. The net effect is increased emissions from higher imports.

Commission staff also estimated criteria pollutant emission using the proposed PSP portfolio. Staff estimated total nitrous oxide, sulfur dioxide, and particulate matter emissions. Staff used fuel burn, number and type of starts, and generation output from SERVIM and applied appropriate emissions factors to calculate emissions. Emissions were counted from all emitting generation in California by CARB air basin for more locational granularity, and where available, using plant-specific criteria pollutant emissions factors. Criteria pollutants were counted from generation within California only, and not from unspecified imports. Then, emissions were grouped into two simplified categories: those from generating units located in disadvantaged communities, as defined by the California Environmental Protection Agency and in D.18-02-018 (even if emissions may migrate beyond the disadvantaged community) and those from generators not located in disadvantaged communities (even if emissions may migrate into such communities).

SERVIM results indicate a downward trend for criteria pollutants, with total pollutants decreasing about 7 percent between 2026 and 2032 due to a shift from fossil generation to geothermal and other renewable resources. More detailed information about the SERVIM analysis conducted to support this decision is available on the Commission's web site.⁸

Also posted is the RESOLVE analysis package developed by Commission staff that includes more detailed inputs and results for the 38 MMT Core with 2020 IEPR Demand and High EV Penetration scenario. The package also contains a sensitivity scenario based on the 30 MMT Core portfolio, updated with the 2020 IEPR assumptions and using the 2020 IEPR High EV penetration

⁸ <https://www.cpuc.ca.gov/industries-and-topics/electric-energy/electric-power-procurement/long-term-procurement-planning/2019-20-irp-events-and-materials>

assumptions. All scenario assumptions in the sensitivity align with the 38 MMT Core with the 2020 IEPR High EV scenario assumptions, except that it has a lower GHG target. This sensitivity was developed to better understand the incremental buildout that would be needed if the GHG target was lowered below 38 MMT in a subsequent cycle.

On the basis of these results, we conclude that the portfolio described in Table 6 and Table 7 above meets the reliability standards we have set, with a LOLE result of under 0.1 in all study years.

We will adopt this portfolio as the PSP portfolio, and its associated GHG target as the CAISO electric sector limit for 2030, for several important reasons. First, the portfolio represents an aggregation of the actual procurement plans of the LSEs subject to our IRP requirements. Thus, it should reflect a realistic representation of the actual procurement taking place among the various LSEs today to meet the myriad state goals.

Second, the portfolio is based on a demand forecast that is reasonably expected to occur, while including more aggressive load growth assumptions for electric vehicles from the 2020 IEPR. This represents a conservative approach to ensuring reliability while pursuing our GHG emissions reduction goals in the next decade or less.

Third, the portfolio meets a GHG target that is more aggressive than the one previously adopted by the Commission in D.18-02-018 and re-affirmed in D.19-04-040 and D.21-02-008. As the state sees the ongoing and worsening effects of climate change on our electricity system, and with the setting of 2045 goals for carbon neutrality, a 38 MMT target represents an important step to reducing the impact of the electricity system on the state's emissions overall.

Fourth, the portfolio has been modeled to be reliable, according to our LOLE standards, as analyzed by both our own staff and the CEC's separate analysis.

We do not go as far as adopting a 30 MMT target, as some parties recommend, for a few reasons, notably because LSEs did not submit 30 MMT plans and the portfolio has not been subjected to production cost modeling. We always maintain openness to revisiting the target in future IRP cycles and for future planning years. At this stage, however, the 38 MMT target represents a major resource buildout that requires approximately a 40 percent increase in nameplate capacity of the electric system in the state within less than a decade. To achieve this portfolio, an average of approximately 4,000 MW of new capacity in NQC will need to be added each and every year through 2032.

In addition, an important reason that we develop this resource portfolio is to have it considered by the CAISO for transmission planning purposes, as discussed in more detail in the next section of this decision. Adopting the 38 MMT portfolio now while continuing to analyze deeper GHG emissions reduction scenarios allows us to proceed in an orderly, step-to-step fashion to build out the grid infrastructure needed to support future generation and storage projects that will be needed in the next several decades.

This portfolio is on the pathway that leads to the 2045 carbon neutrality goals, and we intend to continue proceeding in that direction.

5. Portfolios for Use in CAISO 2022-2023 TPP

5.1. Base Case Portfolio

As already stated above, the 38 MMT Core Portfolio, updated to include the 2020 IEPR demand forecast with the high electric vehicle forecast, is adopted as the PSP. The August 17, 2021 ALJ ruling proposed that the PSP portfolio

would be transmitted to the CAISO as both the reliability and policy-driven base case scenario to be analyzed in the 2022-2023 TPP.

As a reminder, in the 2021-2022 TPP cycle, the CAISO is analyzing the 46 MMT portfolio adopted by the Commission in D.21-02-008 as the reliability and policy-driven base case. The sensitivity portfolios still under study as part of the 2021-2022 TPP cycle include a 38 MMT sensitivity portfolio, as well as a portfolio with 8 gigawatts (GW) of offshore wind designed to test the grid needs to support buildout of offshore wind resources at various locations by 2030.

5.1.1. Comments of Parties

The majority of parties supported using the 38 MMT Core portfolio as a reliability and policy-driven base case portfolio for the 2022-2023 TPP. There was some difference of opinion as to whether the 38 MMT Core case or the high EV forecast should be used, whether the PRM persisting in perpetuity should be assumed, and a few other factors.

Generally, LS Power, LSA, SEIA, Vote Solar, IEP, AWEA, GridLiance, CEJA, SDG&E, CalWEA, CCE and Brookfield supported the 38 MMT core case. GSCE would prefer the high electrification forecast proposed in the policy-driven sensitivity case to be used as the base case. CESA recommended using the 2020 IEPR high EV forecast case.

BAC and CalCCA opposed requiring a higher PRM to persist throughout the ten-year planning period. GPI agreed, and also suggested the 2020 IEPR mid-demand forecast.

Cal Advocates opposed including any OOS resources as too costly. Hydrostor suggested that using the prior RSP portfolio along with 1,600 MW of long-duration storage is a better choice as the PSP.

SCE supported using the 38 MMT core scenario, but with at least 3,500 MW of energy storage removed.

Additional parties opposed the use of the 38 MMT scenario as the base case. BAMx and CCSF opposed because of opposition to the inclusion OOS resources, because they believe not all costs were included.

PCF recommended the 30 MMT scenario as the base case. Middle River stated that the use of the 38 MMT with the PRM requirement persisting will result in overbuilding. Western Grid recommended including 3-4,000 MW of additional thermal retirements as more realistic. PG&E stated that the recommended base case portfolio does not reflect resources needed for local reliability or zonal transmission needs.

Finally, Pattern asked that the Commission request that the CAISO study increases to the maximum import capability (MIC) for New Mexico wind in this TPP cycle.

5.1.2. Discussion

To maintain a consistent approach between resource planning, procurement activities, and transmission planning, we will utilize the adopted PSP portfolio as the portfolio for the reliability and policy-driven base case for 2022-2023 TPP purposes.

We appreciate some of the suggested refinements by parties, and Commission staff will continue to work with the CAISO on particular elements, including, but not limited to, the issues raised by Pattern on the potential for MIC increases.

Our selection of the high EV demand forecast from the IEPR, as part of the adopted PSP portfolio, should address several parties' concerns about the appropriate demand forecast.

With respect to the comments about inclusion of OOS resources and their not including total transmission costs, RESOLVE includes new transmission cost estimates for OOS resources based on assumptions developed for the CEC's Renewable Energy Transmission Initiative 2.0.⁹ Furthermore, developing more refined and updated transmission costs is part of the purpose of the TPP study that the CAISO undertakes, to produce better cost analysis. However, we remain convinced that some OOS resources will need to be developed to support the 38 MMT scenario buildout, and therefore believe it is prudent to include at least a subset of those resources in the portfolios being studied in the 2021-2022 TPP assessments now.

As far as persistence of the PRM assumptions, it may be that a new paradigm needs to be developed and adopted for reliability purposes going forward. However, until the conclusion of such an effort, we find it prudent to continue to include conservative assumptions for reliability in the TPP portfolios now, since they have recently proven to be important for maintaining reliability in the very near term.

5.2. Sensitivity Portfolio

For the 2022-2023 TPP, the August 17, 2021 ALJ ruling proposed the option of transmitting one additional sensitivity portfolio to be analyzed by the CAISO for transmission needs in the future. This sensitivity portfolio was designed around two key factors: a 30 MMT GHG emissions limit in 2030, and the use of the high electrification demand assumptions developed by Commission staff using the PATHWAYS model in 2020 for modeling purposes. Combining these sets of aggressive assumptions was designed to push the transmission system to

⁹ More details are available at: <https://reti.databasin.org/>

its limits and identify the next potential transmission investments needed to achieve higher penetrations of zero-emissions resources at the same time as load is increasing due to electrification of buildings and transportation, as California proceeds on the trajectory toward a carbon neutral electricity system by 2045.

This recommended sensitivity portfolio was built with 2030 as the primary planning year. The GHG target is 30 MMT in 2030, and approximately 27.7 by 2032. Interpolation between 2030 and 2045 is consistent with the approach used in the 2045 “framing scenarios” studied during the 2019 RSP development to meet Senate Bill (SB) 100 and 2050 economy-wide decarbonization goals. The load forecast is based on the 2020 IEPR high electrification scenario.

Transportation electrification was also an important element of this portfolio.

Assessment of this portfolio was designed to provide important insight on transmission needs. Local capacity issues may be significant in a high electrification future, especially in constrained areas like the Los Angeles (LA) Basin.

RESOLVE results indicated that the combination of lower GHG targets and higher demand due to electrification leads to significant additional solar and battery storage buildout in the sensitivity portfolio compared to the 38 MMT Core Portfolio. These resources total about 25 GW more by 2032 in the sensitivity portfolio. This portfolio has not yet undergone PCM analysis. Figure 6 and 7 and Table 8 below show the selected resources and comparison with the 38 MMT Core portfolio.

Figure 6. Selected Resources – 30 MMT Portfolio with High Electrification

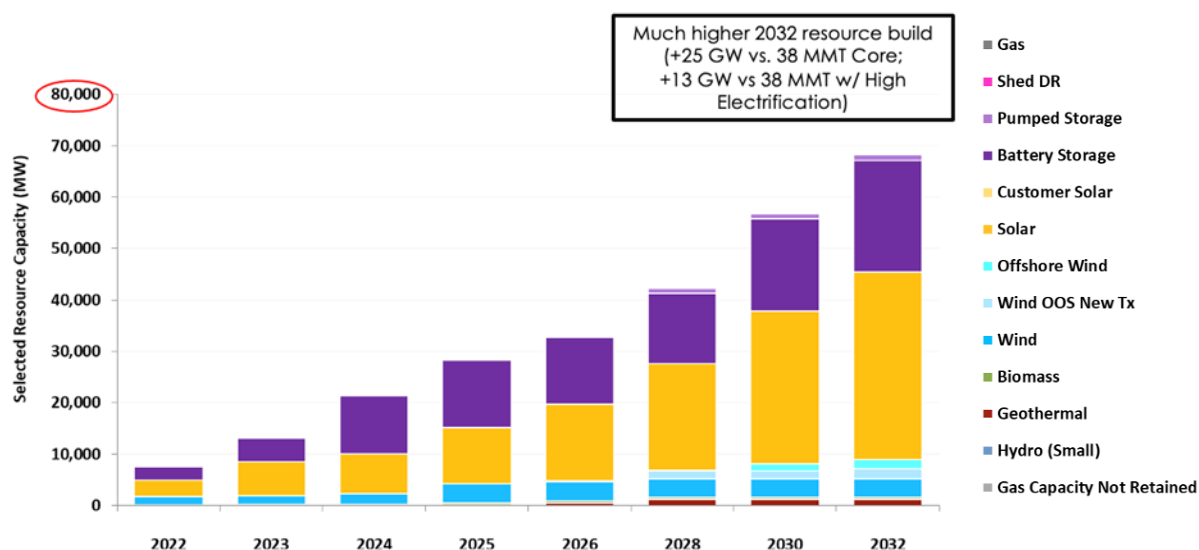
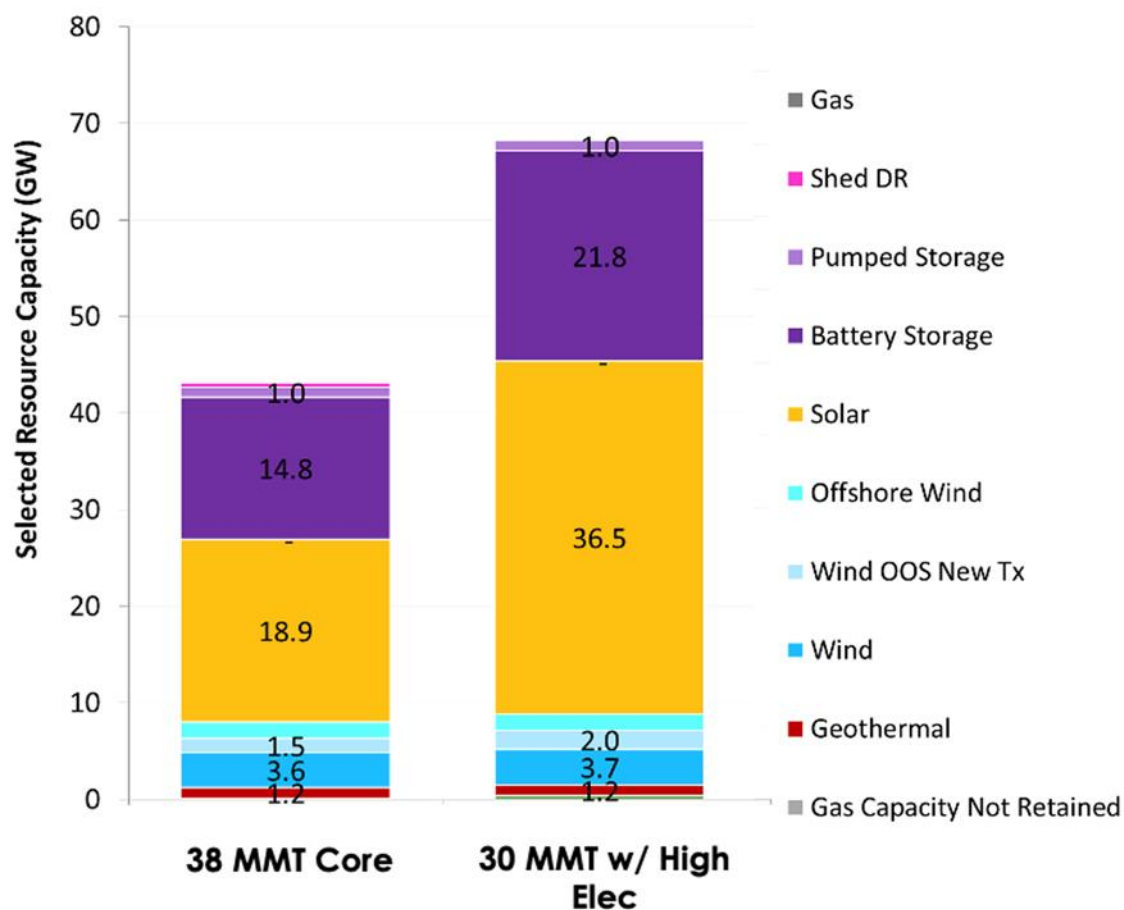


Table 7. 2032 Resource Composition of the 30 MMT Portfolio with High Electrification

Resource Type	Capacity Amount (MW)
Biomass	373
Geothermal	1,156
Wind	3,687
OOS Wind on New Transmission	1,970
Offshore Wind	1,708
Solar	36,552
Battery Storage	21,775
Pumped Storage	1,001
Shed DR	176
Total Resources	68,368

Figure 7. Comparison of New Resource Buildout in 2032 between the 30 MMT Portfolio with High Electrification and the 38 MMT Core Portfolio



Several issues must be addressed before the CAISO can study the 30 MMT with High Electrification portfolio as a sensitivity. CAISO has never used two sets of demand forecast assumptions in an individual TPP. The transmittal of this portfolio would require the CAISO to do so because the base case assessment would utilize the 2021 IEPR load forecast and the policy-driven sensitivity assessment would have to use an alternative high electrification demand forecast, if agreed to by the CEC, CAISO, and this Commission.

Given the above factors, the Commission, CEC, and CAISO staff have been assessing the options for developing a high electrification forecast for use in the 2022-2023 TPP. Specific factors that need to be addressed include:

- Appropriateness of the PATHWAYS model forecast for a high electrification analysis and whether additional modifications are required.
- Implications of deviating from the interagency single forecast set (SFS) agreement.
- Consistency with the RESOLVE assumptions to develop the 30 MMT with high electrification sensitivity portfolio.
- RESOLVE modifications needed to update the sensitivity portfolio.
- Mapping of EV demand to plausible specific locations within the CAISO system, given that distribution is unlikely to be uniform.
- Understanding of to what extent a more granular EV demand distribution is necessary for CAISO analysis.
- How and when EV demand mapping to transmission locations would occur.
- Timing implications for the State's SB 100 goals if a 30 MMT high electrification sensitivity is not considered in the 2022-2023 TPP.

5.2.1. Comments of Parties

Among the 22 parties who commented on the sensitivity proposal, the vast majority supported developing this policy-driven sensitivity portfolio for the TPP based on the 30 MMT GHG target in 2030, with the high electrification load assumptions.

The following parties commented in support: CalCCA, CCE, CCSF, CEJA, CESA, EDF, IEP, LDESAC, LSA, SEIA, Vote Solar, MRP, PCF, PG&E, SCE, SDG&E, and UCS.

EDF specifically commented that this would produce a useful scenario to inform the Commission's policymaking and facilitate the use of the 30 MMT target in the next IRP cycle. EDF and Western Grid also would prefer that this

portfolio be used as the base case, because analyzing a sensitivity does nothing to solve the continuing reliance on natural gas generation into the next decade. They also suggested a manual insertion of at least 3-4,000 MW of gas generation retirements into the portfolio.

SDG&E commented that the high electrification load scenario also meshes well with the high battery penetration scenario and the associated high charging loads they expect to see in the future.

MRP suggested incorporating other “bookend” assumptions, such as climate-change-driven wildfire risks and impacts on demand, as well as considering a policy-driven sensitivity which hybridizes the gas peaking unit fleet with battery energy storage to achieve GHG reductions.

PCF suggested modeling a high EV/high electrification scenario that assumes bi-directional charging connectivity for EVs.

Hydrostor, LSA, SEIA, and Vote Solar all commented with reference to the likelihood that a large amount of thermal generation could retire during the planning horizon, and therefore should be factored into the scenarios analyzed.

SDG&E recommended consideration of expanding the TPP timeframe from 10 to 12 or even 15 years to account for the long lead times associated with transmission development.

CEJA requested that future transmission policy cases be based on carbon neutrality expectations as soon as possible to represent the transformative transition that is needed to meet both air quality and climate goals and requirements.

Finally, IEP recommended that the Commission coordinate with the CAISO regarding whether their 20-year Transmission Outlook initiative could

use a scenario that is substantially similar to the 30 MMT case with high electrification, to foster efficient use of the CAISO's modeling resources.

While PG&E was somewhat supportive, PG&E commented that our collective efforts might be better spent addressing the missing pieces required for a more robust IRP process, including establishing new planning metrics, location-specific resource requirements, estimated costs of new transmission, magnitude of renewable curtailment due to transmission congestion, guidance on gas-fired resource retention and retirement, and minimum generation requirements for local areas.

The CAISO, in its comments, opposed this sensitivity portfolio proposal. In particular, the CAISO points out that both the base case and sensitivity portfolios in the TPP require the same level of modeling detail and data granularity to study the portfolios accurately. The CAISO also feels that the portfolio should be known to be reliable (*i.e.*, with an LOLE result of less than 0.1) up front, in order to produce meaningful power flow results and identify transmission needs.

The CAISO is also concerned that the underlying high electrification load assumptions in the proposed 30 MMT sensitivity portfolio are not derivative of, nor compatible with, the load forecast from the IEPR. According to the CAISO, this is important because the CEC's IEPR forecast provides detailed and internally consistent assumptions for a variety of load modifiers. In addition, the CEC derives the busbar demand forecasts from its IEPR forecasting methodology, which has been vetted with stakeholders. This factor, according to the CAISO, is critical for TPP analysis, because it provides geographically granular data regarding future demand, and allows the CAISO power flow analysis to determine where reliability upgrades are needed. The CAISO states

that if the load growth is not mapped to the correct busbar, the power flow analysis may provide overly optimistic or overly conservative results.

Further, the CAISO is concerned that since the 30 MMT portfolio is not based on the 38 MMT portfolio for the base case, the CAISO would need to dedicate time and resources to develop an entirely new basis for the portfolio, as a starting point for modeling this sensitivity, which would essentially double the TPP analysis workload.

GPI also opposed the suggested sensitivity portfolio, instead recommending the 38 MMT high renewable baseload and 38 MMT high electrification scenarios as the policy-driven sensitivities, based on the sensitivity cases run to develop the PSP. GPI points out that the solar and battery capacity amounts for the 30 MMT high electrification scenario are approximately half of the solar and battery capacity in the 38 MMT core scenario for the base case.

In reply comments, CESA advised against using forecasts that would represent a deviation from the single forecast set agreement among the agencies, as it is essential for expediting analyses that yield significant results. IEP, in its reply comments, also acknowledged the concerns of the CAISO that the higher load forecast scenarios from the IEPR must be developed in greater detail before they can be used for detailed transmission planning purposes.

5.2.2. Discussion

Although we believe it is important to begin studying a 30 MMT scenario to begin to develop transmission assumptions associated with this lower GHG future as soon as possible, we are persuaded by the CAISO's comments that the case proposed in the August 17, 2021 ALJ ruling is not the best case to study for this purpose.

The CAISO's practical concerns about the lack of similarity between the busbar-level load forecasts in the 38 MMT base case portfolio, based on the IEPR assumptions, and the 30 MMT proposed sensitivity load forecasts based on the PATHWAYS model, convince us that it is more prudent to utilize an appropriate demand forecast from the IEPR that can be paired with 30 MMT assumptions to create a policy-driven sensitivity portfolio for study in the TPP. Producing a high electrification load forecast and creating a 30 MMT high electrification portfolio would likely require several months' more work. Thus, there is not yet a portfolio developed and mapped to busbars to be readily available to be posted as of the development of this decision.

It may be possible to develop a portfolio with the 30 MMT GHG constraint in time to transmit a policy-driven sensitivity portfolio later in 2022, after the adoption of this decision. To facilitate this option, we endorse here the concept and delegate to Commission staff to work with the CEC and CAISO staff to explore development of such a portfolio for study as a policy-driven sensitivity in the 2022-2023 TPP. The portfolio would need to be based on the IEPR demand forecast, and not a PATHWAYS model forecast.

Unfortunately, this delegation to staff will mean that there will be limited opportunity for further stakeholder input on this portfolio at the proceeding level, prior to CAISO's utilization of the portfolio as an input to the TPP. However, given this is for a sensitivity case used primarily to develop future assumptions, it is still important to have a 30 MMT case with high electrification assumptions analyzed, to continue to prepare us for the next phase of infrastructure development. For these reasons, we endorse this sensitivity case and delegate to staff to transfer the requisite busbar mapping results after the adoption of this decision.

5.3. Busbar Mapping

In order to be analyzed in the CAISO TPP process, the recommended portfolios must have each resource mapped to a busbar location on the transmission system. The “resource to busbar mapping” or “busbar mapping” process translates geographically-coarse portfolios to plausible network locations for additional TPP modeling by applying specific rules and criteria.

Commission staff, as discussed in the August 17, 2021 ALJ ruling, proposed to build on the progress in prior TPP cycles with the following updates:

- Utilizing new CAISO transmission deliverability data for available transmission headroom for full capacity deliverability status (FCDS) and off-peak deliverability status (OPDS);
- Incorporating new CAISO transmission constraints definitions different from the nested-transmission zones used in the previous mapping cycle;
- For non-battery busbar mapping, incorporating busbar-level granularity of commercial interest rather than zonal-level of commercial interest;
- Improving the implementation process of the busbar mapping criteria to better capture mapped resources’ compliance with the criteria and to incorporate the latest stakeholder inputs and updated data sets;
- Updating the battery busbar mapping steps to account for the locational information for battery resources that will be provided by RESOLVE;
- Removing the 90 percent transmission utilization limit used in mapping battery resources to busbars in the previous TPP cycle; and
- For co-located battery and solar PV resources, removing the transfer of FCDS status from the solar PV resources to

the battery resources, based on new CAISO transmission deliverability data.

The complete busbar mapping process and updates were described in Attachment C to the August 17, 2021 ALJ ruling. Busbar mapping is being conducted concurrently with the issuance of this decision, and the detailed results are available on the Commission's web site at:

<https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/2019-20-irp-events-and-materials>.

5.3.1. Comments of Parties

Only about half of the parties filing comments discussed the busbar mapping approach in their comments. Generally, most commenting parties were supportive and appreciated the changes and improvements made since prior rounds of busbar mapping.

The most common critique by parties, including AWEA, BAMx, CCE, CCSF, CEJA, Pattern, and SWPG, was for more stakeholder input into the busbar mapping process, including requests for allowing stakeholders to review and comment on the mapped portfolio and the conduct of a workshop.

Most parties supported the updated role that the CAISO interconnection queue is now playing in the busbar mapping. However, several parties noted shortcomings with the interconnection queue in capturing commercial interest in all types of resources (AWEA), or recommended prioritizing other criteria above commercial interest, such as land-use screens (DOW) or local reliability or disadvantaged community designations (CEJA, Sierra Club, PCF). Calpine opposed the local capacity and disadvantaged community criteria for battery mapping.

Several parties criticized treatment of specific resource types. GridLiance supported increasing the resource potential for geothermal in the Southern Nevada area. Hydrostor and LDESAC expressed concerns about mapping long-duration storage as only pumped-storage resources and urged inclusion of other technologies. CESA asked for better inclusion of hybrid resources in the RESOLVE modeling and busbar mapping.

SDG&E expressed support for prioritizing geographic diversification of resources as a risk reduction strategy.

Finally, CEJA and Sierra Club expressed support for linking the geographic specificity of busbar mapping to procurement to ensure that the busbar mapping criteria are utilized in resource development.

5.3.2. Discussion

Each year when we forward a portfolio to the CAISO for TPP analysis, including resources mapped to busbars, there are incremental improvements over the process from the prior year. We will keep the input of parties in mind in developing improvements to the process for the next TPP. In particular, we agree with those parties seeking more diversity of resource types to represent long-duration storage. Ultimately, the best solution to this problem is to have a diversity of resources procured in the portfolios of the LSEs, so that the actual resources can be mapped to busbars instead of needing to make assumptions. Commission staff recognized that the CAISO interconnection queue used in identifying commercial interest as part of the busbar mapping criteria included non-pumped-storage long-duration storage resources and staff factored those projects into the mapping of the RESOLVE-selected pumped storage resources. Similarly, we will seek to improve the land-use screening, in coordination with the CEC, in the next round of busbar mapping.

In response to Calpine's comments about battery mapping in disadvantaged communities, we maintain this portion of the staff-proposed methodology because it supports our overall policy goal of providing more clean energy alternatives in those communities, where feasible.

We also understand parties' general and longstanding desire for more opportunities for understanding and vetting the busbar mapping of the portfolios. Unfortunately, due to the compressed schedule that we always face in transmitting this information to the CAISO, the opportunities are likely to remain limited, unless there is a larger effort to align processes and schedules differently between the two agencies. This is an ongoing area of coordination that we continue to work on. Eliminating the adoption of an RSP in every IRP cycle should help. Finally, to the extent that we can offer more opportunities for stakeholder input without jeopardizing the ability of the agencies to process the information for our separate processes, we will strive to do so.

The detailed busbar mapping results that we are conveying to the CAISO as a result of this decision are included in Attachment A to this decision, with the detailed mapping information also posted on the Commission's web site at: <https://www.cpuc.c.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/2019-20-irp-events-and-materials>.

In summary, these results point to six transmission capability exceedances in six areas. These exceedances could be alleviated by transmission upgrades providing an estimated additional 10,500 MW of transmission capability and costs an estimated \$545 million. These exceedances and potential upgrades are only preliminary projections based on the busbar mapping process utilizing the information and estimates provided in the CAISO's White Paper on

2021 Transmission Capability Estimates For Use in the CPUC's Resource Planning Process.¹⁰ The CAISO's TPP analysis and report will be the final determinant of which transmission exceedances are triggered by this mapping and what upgrades may be needed to alleviate the exceedances. Furthermore, the busbar mapping results may require additional upgrades outside of the CAISO's balancing authority area, such as for the geothermal resources mapped to the Imperial Irrigation District's balancing authority area.

6. Potential Changes to Mid-Term Reliability Procurement Requirements

This section of the decision addresses whether there is any need to modify any aspect of the MTR requirements recently adopted in D.21-06-035, in response to the Governor's emergency proclamation, ongoing summer reliability efforts in D.21-11-003, or any other clarifications needed based on ongoing procurement and implementation efforts.

6.1. Acceleration of Additional Procurement to 2023

On July 30, 2021, Governor Newsom issued a Proclamation of a State of Emergency (Proclamation) in response to the significant and accelerating impacts of climate change in California. The Proclamation, among other things, states that:

2. ... The California Energy Commission is directed, and the California Public Utilities Commission and the CAISO [California Independent System Operator] are requested, to work with the State's load serving entities on accelerating plans for the construction, procurement, and rapid deployment of new clean energy and storage projects to

¹⁰ Available at the following link: <http://www.caiso.com/Documents/2021-2022TransmissionPlanningProcessWhitePaperPostedCall072721.html>

mitigate the risk of capacity shortages and increase the availability of carbon-free energy at all times of day.

13. The California Public Utilities Commission is requested to exercise its powers to expedited Commission actions, to the maximum extent necessary to meet the purposes and directives of this proclamation, including by expanding and expediting approval of demand response programs and storage and clean energy projects, to ensure that California has a safe and reliable electricity supply through October 31, 2021, to reduce strain on the energy infrastructure, and to ensure increased clean energy capacity by October 31, 2022.

15. The California Energy Commission, in consultation with the California Air Resources Board, the CAISO, and the California Public Utilities Commission, shall identify and prioritize action on recommendations in the March 2021 Senate Bill 100 Joint Agency Report, and any additional actions, that would accelerate the State's transition to carbon-free energy.

Though the Proclamation is focused primarily on electricity needs by 2022, there is also ongoing reliability concern about 2023 and beyond.

Notwithstanding revisions that were made to D.21-06-035 in response to parties' concerns about the feasibility of procurement by 2023, the August 17, 2021 ALJ ruling proposed to revisit whether procurement of some amount of capacity counting toward the 11,500 MW of NQC should be accelerated to 2023, instead of 2024 or 2025, and/or whether additional capacity is needed. The August 17, 2021 ALJ ruling also referred to reliability analysis the CEC conducted for the next several years. Most of the implications of that analysis, particularly for 2022 and including the possibility of accelerating procurement already ordered in D.19-11-016 and D.21-06-035, were addressed in the Commission's emergency reliability rulemaking (Rulemaking (R.) 20-11-003).

6.1.1. Comments of Parties

The majority of parties commented that requiring additional accelerated procurement to 2023 from later years would be costly and is not necessary based on the modeling that the Commission staff and CEC have presented in this and other venues. Those parties included AReM, CalCCA, Calpine, CCE, CCSF, CESA, GPI, LSA, SEIA, Vote Solar, Middle River, PCF, and SCE.

Some parties, including AEE, EDF, LS Power, PG&E, and Shell, would support a voluntary opportunity for LSEs to accelerate their procurement and/or incentive mechanisms for LSEs to do so. PG&E proposed a self-funding mechanism where funding generated by penalizing LSEs for late procurement could be used as a reward for others for early procurement, based on a similar mechanism established by the CAISO in its Resource Adequacy Availability Incentive Mechanism. The PG&E proposal was opposed by PCF in reply comments.

A few parties suggested other expedited approaches, such as accelerating interconnection and transmission projects (AWEA and SDG&E), allowing fossil-based procurement (Diamond, Wartsila), or the Commission offering further guidance on cost recovery treatment (SDG&E).

The CAISO was the only party seeking acceleration of a portion of the 2024 or 2025 procurement requirements into 2023, supporting procurement to reach at least a 17.5 percent PRM with a net peak requirement.

6.1.2. Discussion

On December 2, 2021, the Commission adopted D.21-12-015 in the Rulemaking to Establish Policies, Processes, and Rules to Ensure Reliable Electric Service in California in the Event of Extreme Weather Events (R.20-11-003).

D.21-12-015 determined the amount of additional reliability procurement needed

for 2022 and 2023 and authorized the IOUs to procure resources to meet that need for all Commission-jurisdictional load in each of their service territories. D.21-12-015 provides a path for developers or LSEs to bid accelerated online dates of IRP resources into solicitations for 2022 and 2023 summer reliability resources. This direction in D.21-12-015 adequately addresses the issues raised in the August 17, 2021 ALJ ruling. Consequently, we will not consider further acceleration of IRP-ordered resources here.

To help ensure that the amounts of reliability procurement authorized in D.21-12-015 are realized, we note that the Tracking Energy Development (TED) Task Force, a joint effort of the Commission, the Governor's Office of Business and Economic Development, the CEC, and the CAISO, has been formed to track and support energy projects in progress. We also recognize the risks associated with the mid-term period and emphasize the importance of all LSEs succeeding with their MTR requirements. Along with the formal MTR compliance reporting requirements, which require reporting twice a year, Commission staff is informally engaging with LSEs through meetings and data collection, to help gather information about opportunities to ensure the success of their procurement processes. This will continue in 2022, and may inform the next focus areas of the TED Task Force, or other ways to support IRP procurement success.

We also want to avoid having the procurement requirements in D.21-12-015 create uncertainty for LSEs procuring for MTR compliance with D.21-06-035 requirements. D.21-06-035 contains the following text:

Meanwhile, for the capacity procurement requirements in this order, we will allow LSEs to show procurement that they have conducted to support the Commission's orders or requirements in the context of the RPS program, as well as for

emergency reliability purposes in R.20-11-003, as compliance toward the requirements herein.¹¹

While we want to avoid duplicative procurement where possible, we understand one or more of the IOUs may propose to use the CAM for procurement that serves reliability beyond 2022 and 2023, and this may cause uncertainty among non-utility LSEs about the impacts on their MTR requirements. For that reason, we reiterate the following text from D.21-12-015:

If an IOU elects to continue to charge all customers in its service territory for the ongoing costs of UOS [utility-owned storage] resources after 2023, the resource will not count toward the IRP MTR requirements for the LSEs in the utility's service territory."¹² In addition, D.21-12-015 states that "The decision [D.21-06-035] did not prescribe the outcome for future resources or for resources being charged to all customers in an IOU's service territory via the CAM."¹³

The exception to this is where the IOUs are procuring on behalf of other LSEs. IOUs should not be able to allocate costs associated with emergency reliability resource procurement via the CAM while also simultaneously counting those resources toward MTR procurement requirements. To mitigate the risk of duplicative procurement that the D.21-06-035 language quoted above was aiming to address, we will seek to account for this in the development of a programmatic approach to procurement discussed in Section 7.3 below.

With respect to PG&E's proposal to provide incentives for accelerated procurement, we note that the current framework for procurement does not support an incentive framework, as proposed, without a lot of additional process

¹¹ D.21-06-035, at 80.

¹² D.21-12-015, at 108.

¹³ D.21-12-015, at 109.

to work out details. Therefore, while the concept has some appeal, it is not self-executing, and we decline to spend the additional time and process that would be required to immediately create such an incentive framework just for 2023. We may consider incentive frameworks more broadly as we contemplate a more programmatic approach to IRP in the future, as discussed further in Section 7.3 below.

Finally, because of the importance of MTR procurement for system reliability, we strongly encourage the LSEs, during their procurement processes, to focus on project viability, including, but not limited to, such issues as transmission access, deliverability, developer experience, and ability to secure timely financing.

6.2. Fossil-Fueled Generation Procurement

This section discusses whether natural gas upgrades at existing sites should be considered eligible resources to meet the MTR requirements of D.21-06-035. At the time the MTR decision was issued, the Commission chose to await the results of additional reliability analysis from the CEC before deciding whether to allow natural gas-fueled resources of any sort to count toward the MTR requirements, and promised to revisit the question of natural gas eligibility in this decision. In addition to the question of whether there was a need for additional resources, one of the uncertainties identified was with respect to the potential for supply-chain risks associated with battery storage, since there is a large quantity of this single type of resource expected to be relied upon during the MTR timeframe and at unprecedented levels.

Parties were also asked to comment on the assumptions and analysis in a Commission staff paper titled “Considering Gas Capacity Upgrades to Address Reliability Risk in Integrated Resource Planning.” This paper was intended to

compare the economics of some potential modifications and/or upgrades to existing natural gas plants with other resources already eligible for compliance with the MTR decision, as well as briefly present other potential considerations for allowing gas capacity upgrades to fill the reliability need identified in the MTR decision.

6.2.1. Comments of Parties

AEE, AReM, EDF, PCF, PG&E, UCS, and NRDC all commented that the CEC analysis shows that the existing MTR requirements in D.21-06-035 are sufficient for system reliability. Middle River, Wartsila, SCE, SDG&E, Calpine, and SoCalGas took issue with the assumptions and conclusion of the analysis to test the reliability of an equivalent amount of thermal resources in place of the PSP portfolio. PG&E commented that the CEC's modeling was consistent with its modeling and that of SCE. EDF commented that the amount and nature of procurement already ordered should be sufficient even with an additional 1 GW of unplanned existing natural gas plant retirements. Further, AEE, CEJA, Sierra Club, DOW, the joint CCAs, PCF, NRDC, and UCS all point out that the CEC's analysis shows that zero-emitting resources are not any less reliable compared to thermal resources.

Wartsila was most concerned about the issue of battery risks and commented that further investigation should be conducted, acknowledging the possibility of more than one issue occurring at the same time.

Other parties felt that the battery risk were manageable. CEJA, Sierra Club, DOW, EDF, and the joint CCAs argued that the PSP will be reliable, even if some of the battery storage is delayed in the 2023-2026 timeframe. EDF argued that battery performance to date supports the conclusions that it can meet net peak load. The Joint CCAs also argued that the CEC's focus on battery risks

should also acknowledge that the same risks apply to natural gas infrastructure, too.

Many parties also responded to the questions about whether natural gas efficiency upgrades, repowers, or other modifications of natural gas plants at existing sites should be allowed to count toward MTR requirements with arguments similar to those we have addressed before in this proceeding.

Calpine pointed out that the Commission and CEC analyses both assume that nearly the entire natural gas fleet must be retained in the mid-term. Most of the environmental parties, including EDF, UCS, NRDC, CEJA, Sierra Club, and DOW, commented that there is no need to order or allow any additional natural gas resources. AEE, Cal Advocates, CCE, the Joint CCAs, and PCF also opposed allowing upgrades or modifications to natural gas resources to count toward MTR requirements.

The CAISO's main concern is about the risk of additional thermal power plant retirements in the MTR timeframe, and commented that the reliability must run (RMR) designation is not sufficient or sustainable for keeping existing plants online.

Many parties recommended additional scenario analysis around these questions. UCS and NRDC would like to see the economic analysis of gas upgrades re-run with the 30 MMT GHG target as the 2030 goal. Cal Advocates suggested more gas price sensitivities due to recent gas price increases. GPI would like to see sensitivity analysis around gas plant operation at higher temperatures, as well as a thorough assessment of the ability of additional clean energy or baseload renewables to serve the same role as gas upgrades.

GPI and the Joint CCAs argue that RESOLVE analysis is not granular enough to support conclusions about emissions and needs to be supplemented by SERVVM analysis.

AEE felt that the cost savings identified from potential natural gas upgrades were de minimis, while IEP called the emissions impacts of the same gas upgrades negligible.

PG&E suggested that the Commission and CAISO collaborate and use a systematic approach for existing resource retention and retirement planning.

Ultimately, parties were split on whether the Commission should allow natural gas upgrades to count toward MTR requirements. About half of the commenting parties supported the option of gas upgrades counting toward the capacity requirements.

AReM, CLECA, Calpine, Diamond, IEP and Shell would prefer that the Commission allow fossil-fueled resources to count toward the D.21-06-035 capacity requirements.

AReM supported allowing gas upgrades to count and asked that the Commission be explicit and detailed as to the quantity and type of gas upgrades allowed. CLECA recommended that the financing period not exceed the useful life of the investment. Calpine supported allowing upgrades in 2020 to count toward MTR requirements, with the utilities allowed to file a Tier 1 Advice Letter for this eligibility. IEP supported the proposal with no minimum contract duration. Middle River suggested allowing gas upgrades up to 880 MW. PG&E opposed requiring procurement of natural gas upgrades, but did not oppose allowing LSEs the option (as did SDG&E), but without a ten-year minimum contract period. Shell supported allowing efficiency upgrades at existing sites

and new, efficient peaking generation with the capability to burn hydrogen in large portions.

Parties who opposed allowing natural gas upgrades to count had the following input. Cal Advocates suggested further analysis reflecting higher gas prices and was concerned about the potential for exercise of market power. CEJA and Sierra Club felt that the Commission staff paper wildly underestimated the cost of gas capacity and failed to consider the impacts of pollution on disadvantaged communities. CESA supported hybrid gas and storage facilities, but overall felt that the analysis was not transparent enough in its assumptions.

In sum, parties are split on whether gas upgrades should be allowed to count toward MTR requirements or not. No party recommends that gas upgrades be required.

6.2.2. Discussion

In comments in response to the October 13, 2021 ALJ email ruling on natural gas issues, numerous parties lament both the fact that natural gas eligibility issues keep being raised in this proceeding and the relatively small amount of time for parties to respond to these controversial and thorny issues.

These same themes are true for the Commission's treatment of this issue overall. Whether natural gas plant upgrades should be eligible for MTR requirements is one of many issues associated with the role of natural gas resources in our electricity system that have not been addressed comprehensively yet in this proceeding or its predecessor.

Almost since the inception of this IRP process, questions have been raised about the assumptions used for the retention of existing natural gas resources. The CAISO is rightly focused on and concerned about the potential for

additional retirement of existing fossil-fueled resources and the potential impact on system reliability. Though modeling suggests that a large amount of other zero-emitting resources with equivalent NQC values can replace the retiring fossil-fueled generation, the reality is that these modeling results have not been tested operationally in a system of this scale anywhere, as discussed further in D.21-06-035.

While the CEC's analysis helps show that zero-emitting resources are capable of maintaining reliability at levels equivalent to thermal resources under modeled conditions and that individual battery and other risks can be overcome, outstanding concerns remain about the possibility of various risks occurring simultaneously rather than in isolation. In such a scenario, we may need contingency options for maintaining reliability.

We prefer to address this set of issues in a more comprehensive manner in the context of a new programmatic procurement approach, discussed below in Section 7.3, and supported by additional analysis. In 2022, we will begin additional analysis and process around the risk of thermal plant retirement. This likely will involve updating our inputs and assumptions to better reflect retirement risk and may also require improving modeling methods and tools. In addition, more information needs to be gathered and utilized based on existing thermal plant contract expiration dates, contributions to local reliability needs, and other factors.

In addition, as numerous parties have been pointing out for some time, this requires close coordination not only with the CAISO, but also with our own resource adequacy program and requirements. We anticipate being able to complete robust additional analysis around the need for additional fossil-fueled infrastructure, if any, during the next IRP cycle in 2022 and 2023. We

acknowledge that many solicitations and contract negotiations for new capacity resources for existing IRP procurement requirements will be in process by the time this analysis is complete. However, we see value in further analysis to inform additional and/or future procurement requirements, as well as to inform the development of a programmatic approach to procurement discussed further in Section 7.3 of this decision.

6.3. Other Necessary Clarifications

In this section, we address one clarification that is needed to D.21-06-035. The text was based on revisions to the proposed version of that decision that was revised in response to party comments. With respect to the ten-year requirement for contracts associated with D.21-06-035, that decision contains the following text on page 70:

Consistent with D.19-11-016, as well as § 454.51(d) requirements surrounding long-term commitments to renewable integration resources, we also find that it is necessary to require long-term contracts for the procurement specified herein. Long-term is defined as at least ten years. This ten-year requirement applies to the period of the contract, and is not based on the resource's online date.

The last sentence was revised in response to a comment on the proposed version of D.21-06-035 before adoption, from EBCE. The rephrasing was intended to address a situation raised by EBCE in comments, about whether and how a contractual counterparty may substitute deliveries from other resources it owns in the event that a new resource is delayed in coming online. In the course of editing, this sentence inadvertently and unintentionally introduced a different concept, seeming to suggest that a ten-year contract period could begin before a project is online. This was not the intent.

To address this error, in this decision we propose to delete the last sentence in the excerpt above, and replace it with the following text: “This minimum ten-year contract period is intended to spur the development of new resources and begins once the new resource is online and delivering energy and/or providing capacity. In the event that a resource is delayed in coming online, it is permissible for an LSE to utilize capacity or take energy deliveries from the same contractual counterparty from other owned resources to show compliance with the online date requirements. This still does not relieve the LSE of the requirement to show a ten-year contract for the new resource, however, once it comes online.”

7. Other Procurement Considerations to Achieve the Preferred System Portfolio

This section of the decision discusses other types of procurement considerations that were addressed in the August 17, 2021 ALJ ruling for potential requirements that the Commission could impose.

7.1. Out-of-State Renewable Resources

Several rounds of IRP RESOLVE modeling have indicated the need for some amount of OOS wind resources from New Mexico, Wyoming, and/or Idaho. The reliability base case scenario transmitted to the CAISO for analysis in the 2021-2022 TPP, articulated in D.21-02-008, already included approximately 1,100 MW of OOS resources that were preliminarily determined to need new transmission development outside of the CAISO system. The base case portfolio described in Section 5.1 of this decision includes approximately 1,500 MW by 2032.

There is uncertainty around the exact amount of resources that will ultimately be needed, and also the amount that can be imported through existing transmission. While some amount of OOS resources can likely be imported on

existing transmission, it is likely insufficient to meet the need for OOS resources by 2030 and beyond. CAISO is currently studying in the 2021-2022 TPP the availability of transmission, both inside and outside of the CAISO system, to support OOS resources included in the reliability base case and policy-driven sensitivity portfolios. The results of this study will be finalized around February 2022.

Meanwhile, our assumption has been that some amount of additional transmission development will be necessary to facilitate procurement of OOS renewable resources, including wind. As detailed in the August 17, 2021 ALJ ruling, there are several ways in which the Commission could act to support additional development of OOS renewables and the transmission to support them. Options include:

- Order procurement of a specific amount of resources from a particular state or states;
- Identify particular transmission projects, with specific end points, that should be developed to facilitate imported renewables;
- Work with other state and federal counterparts to ensure transmission siting and construction.

7.1.1. Comments of Parties

In comments on the August 17, 2021 ALJ ruling, most parties expressed support for procurement of OOS resources, but many did not speak to whether a procurement order or other Commission action is needed.

AEE, AReM, EDF, LS Power, Ormat, Pattern, SWPG, PG&E, and TransWest were all generally in favor of reliance on OOS resources. EDF commented that new transmission for OOS resources will help relieve pressure on the amount of suitable land in California for renewable development and contribute to a more resilient grid overall. LS Power supported the proposed

criteria for comparing the OOS resource and transmission options. Pattern and SWPG pointed out the importance of resource diversity for reliability purposes.

Parties opposed to reliance on OOS resources included Cal Advocates, PCF, CCE, and SCE. CCE pointed out that California has less control over the OOS resources. Cal Advocates and PCF were concerned about cost allocation and creating an undue burden on California ratepayers without supporting California-based jobs. SCE argued that forcing an expensive resource and transmission into the resource mix before its time is not consistent with least cost-best fit principles.

7.1.2. Discussion

To avoid confusion, some additional explanation of how wind in the LSE IRP plans was modeled in the PSP is in order. Limited transmission availability associated with several in-state onshore wind resources hindered RESOLVE's ability to select the amounts of in-state wind equal to or greater than the total amounts contained in LSE plans.

There are several reasons for this. First, the transmission constraints released in the 2021 CAISO whitepaper showed a reduced amount of available transmission headroom in areas with high in-state onshore wind potential. Second, there was a need to dedicate transmission for the long-duration energy storage and geothermal resources associated with D.21-06-035, as well as biomass resources. This further reduced the availability of transmission for other resources, particular in-state onshore wind. Finally, according to the 2021 CAISO whitepaper, the transmission upgrades that could allow for the selection of in-state onshore wind to match those reflected in LSE plans could not be online by the time the resources indicated in the LSE plans were needed.

To address these challenges, OOS resources on new transmission were made eligible to meet the onshore wind resource levels identified in the LSE plans. This solution was adopted because the model runs were not able to reach a solution whenever OOS resources were not an eligible resource, and only in-state wind was eligible to meet the amount of wind selected in LSE plans. In other words, the model needed access to OOS resources to function to reach a solution. Even without using the inputs from LSE plans, RESOLVE selects OOS resources in its optimization. Thus, we can infer that OOS resources will be needed, but potentially at a later date.

We also note that the CAISO's current TPP study process may identify specific needs and results for CAISO injection points that should be developed to facilitate the delivery of OOS resources to CAISO load. We may consider further action once this information is identified and finalized.

D.21-02-008 adopted the transmittal to CAISO of a base case portfolio that included approximately 1,000 MW NQC of OOS resources. In the 2021-2022 TPP, CAISO is assessing the transmission implications of injecting 1,062 MW of OOS wind into CAISO at two distinct locations. However, for approval of the 2021-2022 Transmission Plan, a final injection point for these resources will have to be selected. Commission staff will have the opportunity to submit comments as part of the CAISO's stakeholder process beginning in February 2022, as will other parties.

In the meantime, we are satisfied with the inclusion of the amount (1,500 MW) of OOS resources already identified in the PSP portfolio adopted in this decision. To ensure that this amount of OOS resources can come online, additional action by the Commission, the CAISO, or both, may be required. This could include, for example, a future Commission procurement order or the

CAISO's competitive solicitation process. The 2021-2022 TPP results will inform what action, if any, is appropriate. Should additional information from the 2021-2022 TPP prove useful, Commission staff could consider an addendum to the busbar mapping produced with this proposed decision, to take into account identification of preferable specific locations and injection points for the mapping of the 1,500 MW of OOS wind resources, if appropriate.

7.2. Offshore Wind

As noted in D.21-06-035, the recent announcement by the Biden Administration and Governor Newsom about the plan for offshore wind development in California is a very positive development and the Commission strongly supports including this technology as a default candidate resource for consideration alongside others, as expeditiously as possible.

The process to include offshore wind in IRP capacity expansion modeling inputs and assumptions began in early 2020 and is due to conclude in 2022. In 2020, Commission staff worked with the Bureau of Ocean Energy Management (BOEM) and the National Renewable Energy Laboratory (NREL) to update California-specific offshore wind resource profile and cost assumptions, and made these available for informal stakeholder review.¹⁴

In addition, in D.21-02-008, the Commission asked the CAISO to study an offshore wind sensitivity portfolio to evaluate the transmission needs and costs to interconnect approximately 8,000 MW of offshore wind at various potential locations including Humboldt, Diablo Canyon, and Morro Bay. We will use the results of this analysis when they are available in the next IRP cycle, which will

¹⁴ Information from the August 27, 2020 Modeling Advisory Group webinar is available at: <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/2019-20-irp-events-and-materials>

provide support for consideration of additional amounts of offshore wind beyond the 1,700 MW by 2032 that is included in the PSP.

The March 2021 SB 100 joint agency policy report to the Legislature¹⁵ also showed that offshore wind is likely to be needed in California's 100 percent clean energy portfolio by 2045. Commission staff are working closely with the state's Offshore Wind Task Force to coordinate and facilitate actions related to the development of offshore wind.¹⁶

The August 17, 2021 ALJ ruling discussed two discrete actions that the Commission could take to encourage additional focus on offshore wind development:

- Address and preserve use of transmission deliverability rights in the central coast area, which can accommodate approximately 5 to 6 GW¹⁷ of offshore wind generation, interconnecting in the area of the Diablo Canyon Power Plant that will be retiring by the end of 2025, and in the Morro Bay area, where gas-fired generation has already retired; and
- Include some amount of offshore wind into the reliability and policy-driven base case for the CAISO to analyze as part of the 2022-2023 TPP.

We take up these issues in reverse order below.

¹⁵ See: <http://www.energy.ca.gov/sb100>

¹⁶ The Task Force is facilitated by the CEC, and included the Commission, the Coastal Commission, State Lands Commission, Fish and Wildlife, Ocean Protection Council, and the Governor's Office of Planning and Research. Federal agencies include BOEM, Department of the Interior, and Department of Defense. Federal coordination with the state is led by BOEM.

¹⁷ See CAISO 2020-2021 Transmission Plan, <http://www.caiso.com/Documents/BoardApproved2020-2021TransmissionPlan.pdf>, at 28.

7.2.1. Offshore Wind Assumptions in TPP portfolios

This section addresses the amount of offshore wind that should be assumed in the TPP base case portfolio discussed in Section 5 of this decision above. We note that 1,700 MW of offshore wind by 2032 is already included in the PSP portfolio discussed above, to be used as the TPP base case. Thus, here we consider whether additional offshore wind should be assumed and/or required to be procured.

7.2.1.1. Comments of Parties

Generally, most parties did not address this question in their comments. GSCE noted that a ten-year timeframe for offshore wind development is aggressive, but that the resource is going to be needed soon after that anyway, if not earlier. TURN recommended including a higher amount of offshore wind in a sensitivity portfolio, but not in the base case. CalWEA suggested that the CAISO study at least 3 GW at the central coast area, with various other transmission study suggestions.

CalCCA recommended waiting until this year's TPP sensitivity portfolio study is complete before including any offshore wind in a TPP base case. PCF prefers additional distributed resources, given the cost uncertainty of offshore wind. Ormat and GridLiance also prefer to wait for additional study, or until experience about cost and viability is gained from pilot projects.

DOW suggested a 5 GW "placeholder" in the portfolio until the strategic plan required by Assembly Bill (AB) 525 (Stats. 2021, Ch. 231) is completed, as well as the CAISO's 20-year transmission outlook. EDF similarly suggested 4.5 GW, with AWEA suggesting 3-4 GW and Brookfield suggesting 3 GW in the central coast, but with mandatory procurement required.

7.2.1.2. Discussion

We note that the CAISO is in the middle of studying the offshore wind sensitivity portfolio from the 2021-2022 TPP. CEC is the lead agency on the development of the AB 525 strategic plan and we will be coordinating closely. Until these efforts are completed, we are satisfied that 1.7 GW of offshore wind in the 2022-2023 TPP base case portfolio by 2032 is an appropriate starting assumption.

We will further evaluate procurement of offshore wind capacity in the future, but strongly encourage all LSEs to pursue viable opportunities for projects, as they become available during the MTR timeframe and beyond. We will revisit this question of specific offshore wind procurement requirements in the next cycle of IRP.

7.2.2. Central Coast Transmission Issues

The August 17, 2021 ALJ ruling discussed the concept of preserving the transmission capacity in the central coast area associated with the retiring Diablo Canyon power plant, to facilitate deliverability of future offshore wind projects.

7.2.2.1. Comments of Parties

Ten parties supported preserving central coast deliverability rights for offshore wind, including AWEA, Brookfield, CalWEA, CCE, CCSF, EDF, TURN, GSCE, NRDC, and OWC. AWEA specifically suggested conveying a strong policy signal for offshore wind resources in the 2021 PSP and the working with the CAISO to seek a limited waiver to Federal Energy Regulatory Commission (FERC) interconnection rules to reserve transmission capacity at Diablo Canyon. TURN suggested directing PG&E to address, in the next update of its decommissioning plan in Application (A.) 18-12-008, strategies for the maximum

utilization of existing transmission infrastructure at the site to support future offshore wind deployment.

PCF opposed preserving central coast deliverability rights for offshore wind, and along with CESA, LS Power, Joint Solar Parties, and Ormat, expressed opposition to reserving transmission capacity for any specific technology.

CAISO, Western Grid, Hydrostor, LSA, SEAI, Vote Solar, Middle River, PG&E, and SCE expressed caution about the Commission acting in this area, noting that these issues fall within CAISO tariffs regulated by FERC.

PG&E specifically stated, in its comments, that it has not yet made a decision on which of the scenarios described in the CAISO's tariff and Business Practice Manual it will pursue for the transmission deliverability rights at Diablo, and that it welcomes Commission input on this matter that impacts the central coast area. In reply comments, PG&E further pointed out that deliverability rights to an interconnected generator remain fully and exclusively vested with the generator for a period of three years after a generator ceases generation.

7.2.2.2. Discussion

We take seriously several parties' points about non-discriminatory access to transmission by all types of resources. We also understand that interconnection and deliverability ultimately fall within CAISO tariff provisions regulated by FERC.

Nonetheless, the state has a significant interest in fostering the development and deliverability of the resources needed to achieve our clean energy goals. Therefore, in this decision we make clear our policy interest in ensuring that at least a portion of the central coast transmission capacity can be utilized for offshore wind development.

There is significant activity on strategic planning for offshore wind, as most recently articulated in AB 525, and our staff will be actively engaged with the CEC and CAISO, among other stakeholders. As part of this effort, we expect Commission staff to work with the CAISO to monitor and make recommendations for actions that may be needed to ensure the availability of transmission deliverability rights for offshore wind resources. We understand that the CAISO is already undertaking a stakeholder process to consider enhancements to the interconnection rules and processes. This may provide an opportunity to explore ways that the state could acquire and exercise authority within the CAISO's interconnection process, in a manner consistent with both FERC rules and state policy.

In the meantime, we will also require PG&E to consult with, at a minimum, the Commission's Executive Director and/or Deputy Executive Director for Energy and Climate Policy, before taking any action that would impact its transmission deliverability assets associated with Diablo Canyon.

7.3. Development of Programmatic Procurement Requirements

This section addresses our plans to develop a programmatic approach to procurement as part of the IRP process. This section encompasses comments from parties on the topics of retention of existing resources, procurement for system benefit more broadly, as well as the procurement of new resources necessary to reach GHG emissions targets.

The MTR decision (D.21-06-035) included a commitment to continue to explore compliance regimes to address longer-term system reliability requirements in this proceeding, in coordination with the resource adequacy proceeding. The August 17, 2021 ALJ ruling did not propose a programmatic

approach, but invited comment, referencing the November 2020 Procurement Framework Staff Proposal.

7.3.1. Comments of Parties

In comments in response to the August 17, 2021 ALJ ruling, many parties addressed these topics in response to many different questions. In the general category of procurement for broad system benefit, many parties made comments about cost recovery, as the critical path issue.

CalCCA supported the ability of non-utility LSEs to participate in mutual benefit procurement, with cost recovery similar to the existing CAM. CCE also favored a CAM-like approach that would not be limited to utilities.

Middle River commented that as long as procurement remains fractionalized, the Commission may have to consider a new centralized paradigm to secure and retain the new and existing capacity needed to maintain reliability and reduce GHG emissions. Middle River noted that a new nonbypassable charge could be used to support a multi-year framework needed to retain existing generation.

Cal Advocates commented with concern about the Commission's lack of jurisdiction over the rates of non-utility LSEs. Thus, the Commission could not review the reasonableness of mutual benefit procurement costs incurred by non-utility LSEs. Thus, Cal Advocates was concerned the development of such a mechanism would lack transparency and accountability.

SCE and PG&E both suggested reliance on the CAISO TAC rate process for generation or transmission that addresses transmission constraints. Otherwise, they suggested the Commission rely on the utilities as the only viable CPEs in the near term. Shell argued the Commission should not allow

unregulated entities to conduct the mutual benefit procurement and then allocate costs to all ratepayers.

TURN supported the development of a CPE that is not housed within a utility that can be delegated both front-stop and backstop procurement responsibilities. TURN recommended that such an entity should be independent, not own any system assets that create potential conflicts of interest, and subject to regulation by the Commission. Ideally, TURN argued, this organization should be a non-profit that does not need to realize shareholder returns in exchange for performing the role.

When focusing their comments on the need for procurement to meet GHG emissions goals in particular, parties had several specific concerns. CalWEA was focused on offshore wind resources coming online in the mid-decade.

GPI and SCE both focused on the need for a predictable cycle that identifies need determination. CCSF recommended a hybrid approach to need determination that would begin at the system level and then test each LSE's plan.

IEP, Calpine, and SCE recommended making no distinction between new and existing resources, while GSCE recommended focusing only on new resources. CalWEA, LDESAC, Hydrostor, CUE, and OWC all wanted resource-specific need determinations. GPI, PG&E, SCE, SDG&E, Shell and many others prefer an attribute-based need determination. Pattern and SWPG included some detail in their recommendation about the development of "diverse clean peak" criteria for procurement. Middle River also suggested that even a need determination that is GHG-based should include reliability considerations.

PCF, PG&E, SDG&E, and Shell all commented that assigning GHG targets to LSEs based on load served would avoid the need for centralized procurement.

Parties supporting requiring procurement to meet the GHG targets suggested various ways of checking compliance, including allowing opt-outs, using the CSP calculator, and allowing resubmissions of IRPs to address deficiencies, with backstop being triggered only after that step.

Other parties oppose the concept of ordering procurement for GHG reduction purposes. AReM suggested there is no need to create an entirely new procurement obligation; the resource adequacy and RPS programs should be informed by IRP analysis. IEP suggested that more work would be needed to figure out how to enforce LSE-specific GHG targets.

Numerous parties explicitly supported the development of a programmatic approach to GHG-beneficial procurement in their comments, describing multiple ways it could be implemented, including with a clean energy standard, an LSE-based GHG cap, an LSE-based GHG-intensity target, and resource-specific diversity requirements. CCSF, CalWEA, LDESAC, Middle River, AWEA, Calpine, BAC, PCF, GPI, EDF, SCE, LSA, SEIA, Vote Solar, and UCS all explicitly supported developing a programmatic approach to IRP procurement. SCE emphasized that this task is not urgent, because the Commission can rely on the RPS, while taking time to develop the programmatic approach.

CCSF favored the “hybrid” approach described in the November 2020 Procurement Framework Staff Proposal, in which procurement need would be determined and allocated to individual LSEs based on two elements: the result of PCM, which would examine whether the aggregated portfolio meets the electric sector GHG target and LOLE metric; and compliance with individual LSE IRP filing requirements, including a reliability metric and a GHG metric.

AReM, CalCCA, and SD&E opposed creating a new program, arguing that existing programs, including resource adequacy and RPS, in conjunction with IRP, are sufficient for driving GHG-based procurement. PG&E recommended programmatic adjustments to IRP to ensure LSE planning results in procurement, while maintaining that a new compliance regime is unnecessary.

On the topic of needing a mechanism for retention of existing resources, only about half of the commenting parties specifically addressed this issue.

The CAISO noted that it currently has over 400 MW of capacity under RMR contract, backstopping for resources that were not successful in obtaining a resource adequacy contract, and recommended that the Commission direct procurement for both existing and new resources. CalCCA, CCSF, and Diamond argued generally that the Commission should allow procurement of existing resources to count towards future procurement obligations.

Most other parties who commented generally supported creating a specific pathway for ensuring retention of existing resources that are needed for reliability and/or GHG emissions purposes, including the following parties: CAISO, CalCCA, Calpine, CCSF, Diamond, GPI, IEP, LDESAC, Middle River, Ormat, Cal Advocates, PCF, PG&E, and SCE.

Several parties, including CCE, CEJA, and Wartsila, emphasized their opposition to extending the life of any fossil fuel plants scheduled to retire. UCS commented that this issue should be addressed in the resource adequacy proceeding.

Others offered more specific approaches. Calpine suggested requiring LSEs to secure some fraction of the resources in their plans on a more forward basis to ensure that more capacity is secured through contract, while ensuring IRP and resource adequacy reliability targets are aligned. GPI suggested

conducting an assessment of existing renewable resources and their existing contract expiration dates provided by LSEs in their filings. Resources with expiring contracts within the mid-term planning horizon that are included in the baseline but not in LSE's individual re-contracting plans should make up an annual total recontracting capacity requirement that would be allocated proportionally across the LSEs.

IEP suggested establishing an administratively-determined age at which existing plants are deemed to retire and removing those resources from the baseline at their deemed retirement age, making them available to LSEs as incremental capacity. This, according to IEP, would provide long-term contracting opportunities for plant operators that will allow them to repower existing plants or be replaced by new resources.

Middle River favored requiring LSEs to contract with existing thermal resources for multi-year terms, with a minimum contract length of four years. Gas peaking units that are capable of hybridization, according to Middle River, should be required to install short-duration energy storage systems by the third year of their contracts, with a minimum hybridized resource term of ten years.

Ormat would have us distinguish between incremental expansions and modifications at existing contracted facilities, on the one hand, and a more significant repowering and possible expansion at the end of a plant's project life. Under Ormat's framing, repowering or upgrading should be eligible for future procurement in IRP.

Cal Advocates recommended a holistic approach that explicitly plans for some thermal resources to retire over time and for new resources to replace them. Cal Advocates also recommended identifying resource attributes rather than specific resource types or units.

SCE suggested modifying the resource adequacy program to consider net peak load contribution and ability of resources to provide capacity outside of the peak and net peak to facilitate energy storage.

On the topic of how methodologies might account for in-CAISO POU load and procurement when assigning procurement responsibilities to our jurisdictional LSEs, there was broad agreement that it is beyond our authority to assign costs to POUs. Parties voiced support for prevention the potential allocation of procurement responsibility to Commission-jurisdictional LSEs to cover potential POU procurement shortfalls. SCE suggested that the Commission, CEC, and CAISO coordinate efforts and act to ensure the POUs in the CAISO system are procuring their fair share of reliability and clean energy resources. AReM offered a more specific suggestion: a pro-rata share of GHG reductions should be assumed to be performed by the POUs and not assigned to the Commission-jurisdictional LWEs when allocating need.

7.3.2. Discussion

As demonstrated in the comments summarized above, we have a diverse set of issues related to how we evaluate IRP resource needs and IRP procurement requirements, with a diverse set of solutions recommended by stakeholders.

Ideally, one of our objectives is to create a more predictable cadence of the assignment of procurement responsibility to LSEs, supporting our reliability, GHG emissions, and least-cost goals. So far, our procurement orders in IRP have come intermittently on an as-needed basis and not on a predictable timetable, being on a separate path from the planned adoption of an RSP or a PSP. In addition, the related renewables portfolio standard (RPS) program does not ensure procurement of resources to meet the GHG reduction and reliability targets identified in the IRP process.

This leads to a lack of predictability for LSEs and other stakeholders, presents challenges for tracking, may disincentivize early procurement action, and cannot fully address load migration. Further, to date, we have only ordered procurement of resources not included in the baseline, but have not addressed efforts to retain the existing resources included in that baseline.

Taking a programmatic approach can address many of these issues simultaneously and will leverage several of the processes we have already put in place over the past few years, including:

- Intensive data collection and modeling approaches to support assessment of quantity of new and existing resources that can reliably run the grid under various scenarios
- Use of existing load forecasting process from the CEC's IEPR
- Development of resource planning portfolios that support transmission planning at the CAISO.

Our plan will be to establish a durable programmatic approach that does at least all of the following:

- Establishes which LSEs are responsible for contracting with resources, in what time frame, and with what demonstration and compliance regime.
- Ensures that IRP planning processes systematically flow into IRP procurement need allocated to LSEs and vice versa.
- Ensures that IRP procurement need allocated to LSEs can systematically update in response to changing demand forecasts, such as those that may be driven by high electrification or climate-induced temperature increases, as well as load migration.
- Complements the existing resource adequacy and RPS programs, but fills a gap related to mid-to-long-term

procurement that is not currently covered by resource adequacy.

- Allows LSEs to optimize reliance on a mix of existing and new resources, and emitting and zero-emissions resources, to serve their load and meet their reliability and GHG requirements.
- Encourages LSEs to diversify their risk by managing a diverse portfolio of resource types and contracts lengths.
- Establishes key programmatic methodology for the following processes that can systematically flow from IRP planning into LSE-specific procurement requirements:
 - Need determination – determining the quantity and time frame of resources needed for both reliability and GHG emissions goals.
 - Need allocation (*i.e.*, assigning an individual LSE's role in procurement).
 - Compliance and enforcement.
 - Backstop procurement.
 - Cost allocation, if applicable, particularly for backstop purposes.
- Fits within the Commission's statutory authority, including Public Utilities Code Section 380.
- Includes transitional arrangements from past and current procurement approaches, to mitigate risks, including MTR compliance, generator market power, and inequity among LSEs driven by access to legacy resources.

This decision commits to further evolving the Commission's IRP process by developing a programmatic approach to IRP procurement. Shortly after this decision is adopted, we will begin to scope the design of this programmatic approach, taking into account the parties' responses to the August 17, 2021 ALJ ruling. We expect that initial work will begin with one or more workshops, likely in coordination with the resource adequacy and RPS proceedings. Our

aim will then be to develop one or more options to be issued for formal comment from stakeholders by mid-2022. Depending on progress and consensus among stakeholders, our goal will be to adopt a program by mid-2023, with the first compliance year being 2024.

One of the key considerations will be whether there is a need for separate requirements for GHG emissions and reliability considerations. Our initial preference is for one all-inclusive IRP procurement requirement that facilitates LSE co-optimization for reliability, GHG benefits, and cost. But if that proves too ambitious, we may need to consider a more phased approach to the programmatic requirements.

The combination of the RPS program requirements and the fact that numerous LSEs are choosing to exceed their RPS requirements, and the required MTR procurement, means that we should be on a trajectory collectively to meeting the 2030 PSP requirements established in this decision, which gives us a bit of time to develop the programmatic requirements. We also note that the IRP modeling conducted thus far finds that the GHG emissions constraint, even under a 38 MMT by 2030 scenario, does not become binding before 2030. However, this assumes complete compliance with RPS program requirements, that LSEs procure all of the planned resources in their plans, and that all existing non-emitting resources other than Diablo Canyon remain under contract through 2030.

In developing a programmatic approach to IRP procurement, the Commission will also consider as inputs the requirements and procurement plans of POUs that serve load in the CAISO as an input to our process, and how their load and procurement planning should be factored into procurement requirements for Commission-jurisdictional LSEs. In no way are we seeking to

assert control over the POU's processes or requirements, but their load and procurement plans do need to be reflected in the CAISO assumptions in order to form a complete picture of what we need to require from the LSEs under our jurisdiction.

Finally, some of the long lead-time resources that require special treatment have already been addressed in D.21-06-035. There could be some other resource types beyond those identified in D.21-06-035, such as offshore wind, that will require additional procurement action or special program rules, but we can explore this in parallel.

7.4. Locationally-Targeted Procurement

The August 17, 2021 ALJ ruling discussed two specific instances where locationally-targeted procurement may be an option. The first is in instances where the TPP analysis has identified non-transmission alternatives that could provide a reliability benefit at lower cost. The second is in the ongoing effort to evaluate how to reduce and eventually eliminate reliance on the Aliso Canyon natural gas storage facility. These two situations are discussed further in this section.

7.4.1. Storage Projects Substituting for Transmission Upgrades

This section discusses some results from the 2020-2021 TPP¹⁸ that identified two transmission projects that can potentially be replaced by appropriately-sited battery storage, both in Pacific Gas and Electric Company's (PG&E's) service area:

- A 95 MW 4-hour storage resource on the Kern-Lamont 115 kilovolt (kV) system;

¹⁸ See the CAISO-approved plan at the following link:
<http://www.caiso.com/Documents/BoardApproved2020-2021TransmissionPlan.pdf>

- A 50 MW 4-hour storage resource at the Mesa 115 kV substation.

The CAISO determined that these storage resources would mitigate identified reliability needs and would be lower cost than the two previously-approved transmission upgrades. This reflects Commission guidance for the CAISO to identify non-transmission alternatives in the same manner that operational solutions are often selected in lieu of transmission upgrades. These also appear to be the first storage projects that the CAISO itself has initially identified as acceptable non-transmission alternatives within the TPP.¹⁹

The CAISO has put the two transmission projects “on hold” pending development of storage resources at the required locations. If the storage resources are not built, the CAISO will pursue the more expensive transmission projects.

Therefore, we need to consider a process or a methodology to assess and compel the development of specific resources at specific locations. There is no current CAISO mechanism for storage resources to serve as transmission assets in a way that enables developers to recover costs through the TAC. The CAISO, in its approved TPP, assumes that these proposed storage projects would receive market revenues through a power purchase agreement.

In several TPP stakeholder meetings, parties have raised questions and concerns about ambiguities of a storage facility providing market services and getting market revenues, while also serving as a transmission facility, especially during periods of high load when prices are likely high.

¹⁹ In the 2017-2018 TPP, PG&E proposed the Oakland Clean Energy Initiative, which the CAISO approved in that TPP cycle, but that has been subsequently withdrawn by PG&E. See the CAISO-approved plan at the following link:

http://www.aiso.com/Documents/BoardApproved-2017-2018_Transmission_Plan.pdf

The August 17, 2021 ALJ ruling sought party input on whether and how the Commission should act to encourage development of these two storage resources at these specific locations, as well as similar opportunities that may arise in the future.

7.4.1.1. Comments of Parties

Most commenting parties supported building non-transmission alternatives that are identified in the TPP. These parties include AReM, BAMx, CAISO, CalCCA, Calpine, CCE, CEJA, CESA, GPI, Hydrostor, LDESAC, Middle River, Cal Advocates, SCE, and Wartsila.

Only PG&E and SCE commented specifically on the two storage projects identified. PG&E supports using the local resource adequacy central procurement entity (CPE), which would be PG&E in the case of the Kern-Lamont project because the project is in their territory, to conduct solicitations for the non-transmission alternatives, since the project is in a local capacity reliability area. For the 40 MW 4-hour energy storage resource at the Mesa 115 kV substation, PG&E believes that the CAISO should consider reliability issues beyond the reliability criteria and that the transmission upgrades also should be authorized. PG&E also notes that for the smaller project, it is possible that the storage project alone may not meet the reliability need. SCE noted that the operational characteristics of the two storage projects should be flexible enough to function as a market resource and be dispatched to meet the identified reliability need.

Most parties' comments focused on cost recovery issues for non-transmission alternatives. Several parties noted that the CAISO should pursue its storage-as-a-transmission-asset (SATA) initiative, which could enable storage resources to recover costs through the TAC just like traditional transmission

facilities. CalCCA wanted assurance that non-utilities have the opportunity to develop SATA projects. Cal Advocates suggested a CAM-like mechanism so the Commission could ensure cost reasonableness in the procurement process. CAISO did not mention a cost allocation mechanism, but supported the Commission's efforts to enable non-transmission alternatives and emphasized alignment between procurement and transmission planning. In reply comments, CAISO also noted a recent FERC order within a mid-west ISO proceeding that allows SATA cost recovery through the TAC only for a resource under the ISO's functional control.²⁰

Calpine also recommended that if the Commission orders these projects, competitive procurement should be required. PCF supported competitive bidding with a CAM-like cost allocation. Hydrostor supported non-transmission alternatives and stated that storage needs to be both a market-based resource adequacy asset and a transmission asset.

GPI recommended reviewing the distribution investment deferral framework (DIDF) and considering potential use case expansion or adjustment.

Shell commented that the CPE framework should only be used for mutual benefit procurement by regulated entities. TURN would prefer a new CPE structure be developed outside of the utilities.

7.4.1.2. Discussion

CAISO identified these two storage projects in the 2020-2021 TPP as preferred alternatives to two previously-approved transmission upgrades, which have since been put on hold. If these two storage resources are not developed,

²⁰ See 172 FERC P 61132 (F.E.R.C.) 2020 WL 4595919, August 10, 2020.

the CAISO could release the hold and again move forward with the transmission upgrades at these two locations.

The Commission recognizes that development of these storage alternatives to transmission is preferable to allowing the transmission development to proceed.

We are persuaded that development of these two projects will be cost beneficial and potentially faster than developing equivalent transmission upgrades.

For the 95 MW storage project identified at the Kern-Lamont substation, which is in a local capacity area, we will require PG&E to conduct a competitive solicitation as the CPE for its territory under the local resource adequacy procurement mechanism already established in D.20-06-002. This will enable the use of the already-established cost allocation, approval, and compliance requirements. This project will benefit customers of multiple LSEs and is therefore appropriate for the local resource adequacy mechanism procurement through the CPE.

We will require PG&E to show significant progress by filing a Tier 2 Advice Letter by August 1, 2022 showing that this resource will be online by Summer 2023 to meet the transmission needs found by the CAISO. The CAISO may need to commence the transmission upgrade process if the August 1, 2022 showing does not give sufficient certainty of the storage coming online in time. We will also allow a deviation from the “all-source” requirement for local resource adequacy, included in D.20-06-002, to allow PG&E specifically to solicit four-hour storage, because it was identified in the 2020-2021 TPP.

For the 50 MW four-hour storage project at the Mesa substation, which is not in a local capacity area, we will allow a short period of opportunity for a

suitable project to be identified as part of the procurement ordered for MTR. Thus, we direct PG&E to submit a Tier 1 Advice Letter by April 1, 2022, explaining whether a 50 MW storage project with operational characteristics sufficient to meet the CAISO's identified reliability needs is expected to be developed and online by the end of 2022.

Should the Commission find that PG&E has not identified such a project, we will require PG&E to expedite procurement of a storage project to meet this reliability need. Unless PG&E can show it will meet this need as part of its MTR procurement, because the project has been identified specifically as an alternative to transmission investment, it is logical to apply a CAM approach to cost recovery for this particular project as well, since it will benefit all customers in the PG&E service area. For this second project, we will require PG&E to file a Tier 2 Advice Letter by the end of 2022 seeking approval for a project that will meet the needs identified by the CAISO.

Unless PG&E can show its MTR procurement will meet the Mesa need, these two projects will not count toward the MTR requirements for system resource adequacy required by D.21-06-035. This is for two reasons. First, the project needs were identified prior to the need determination used for the MTR decision. Second, because these projects benefit the system as a whole, adding them to the MTR obligations would introduce the need to adjust all other LSE's allocations in D.21-06-035, which is a complex task that is unnecessary for the small amount of capacity covered by these two projects.

Moving forward, the Commission can seek to establish a more predictable process for how similar transmission mitigation or other system benefit projects might be evaluated and approved. This could be considered when evaluating

whether particular procurement needs will require additional procurement action or special program rules, as discussed in Section 7.3.

7.4.2. Aliso Canyon

D.21-06-035 discussed the need to continue coordinate planning for the long-term need for natural gas capacity, as well as the need to take into consideration the impacts on the use of the Aliso Canyon natural gas storage facility from continued reliance on natural gas-fired power plants. A number of parties in this proceeding have recommended that the Commission order geographically-targeted procurement to replace fossil-fueled generation, particularly in disadvantaged communities. The LA Basin has been suggested as a candidate for the first geographic area to be examined and the Commission has expressed its interest in further exploring this issue.

In the Aliso Canyon proceeding (Investigation (I.) 17-02-002), FTI Consulting has conducted an analysis to determine the impacts of a potential closure of Aliso Canyon in 2027 or 2035, the results of which were presented at a workshop on November 3, 2021. The analysis focuses on the amount of winter peak natural gas demand reduction that would be needed in 2027 and 2035 if Aliso Canyon is closed, and then evaluating several scenarios of potential resources that could help fill this shortfall, including electric resources.

The August 17, 2021 ALJ ruling addressed some of the complexities of this type of locational analysis with respect to Aliso Canyon needs, including the interrelated nature of the electricity and natural gas systems in Southern California, both regulated by this Commission and partially controlled by municipal utilities, as well as the potential for counter-intuitive or even counter-productive results. The August 17, 2021 ALJ ruling also asked parties whether

they saw any short-term or least-regrets actions the Commission could take to begin to reduce reliance on Aliso Canyon.

7.4.2.1. Comments of Parties

Many parties seemed to support eventual action regarding procurement in the LA Basin to help alleviate reliance on Aliso Canyon, but almost all parties asked the Commission to conduct additional analysis before proceeding to require procurement. Only four parties (CCE, CEJA, Sierra Club, and EDF) supported any form of immediate action before additional analysis is completed. Conversely, only Middle River, PCF, Cal Advocates, SCE, and SoCalGas seemed to express reservation about Aliso's closure or the possibility of future geographic procurement.

CCE proposed procuring local solar resources immediately. CEJA proposed allowing all LSEs in the LA Basin to procure 1,020 MW of energy storage in the LA Basin and 400 MW in the San Joaquin Valley as "no regrets." They also suggested issuing a staff proposal prior to the issuance of this decision, based on the CAISO analysis and allowing parties two weeks to comment on it. EDF also proposed targeting procurement of clean resources in the LA Basin.

In reply comments, AReM, IEP, and SoCalGas opposed the CEJA proposal, while CESA, EDF, UCS, and the Joint Solar parties supported it. CAISO asked the Commission to provide a generation retirement assessment to inform this matter, and Western Grid criticized the Commission for not having a "plan of service" for the LA Basin and for deferring these issues for too long.

The rest of the commenting parties all supported waiting for additional analysis and/or completing of the full FTI Consulting study for various reasons. CalWEA suggested that the CAISO should study an offshore network that connects the LA Basin to one or more Central Coast substations via undersea

cables. CESA referenced a study it is working on to identify an optional portfolio of zero-emission resources in the LA Basin, including the “low hanging fruit” of hybridization (of gas resources with storage). Western Grid suggested giving the CAISO a core resource portfolio that reduces fossil-fueled generation in the LA Basin by at least 3,000 to 4,000 MW and letting the CAISO find the best transmission solution. GSCE also supports identifying transmission solutions.

Middle River objected to this discussion at all, stating that this is not the appropriate proceeding for Aliso Canyon issues. Cal Advocates commented that locally-sited battery storage is not a no-regrets strategy, because it may give rise to future need for additional transmission solutions.

PG&E recommended that any solutions await the FTI Consulting final analysis due to the complexities described in the August 17, 2021 ALJ ruling. But if the Commission is seeking least-regrets options, PG&E recommended renewables integrated with storage without the capability to charge from the grid, with an emphasis on long-duration storage.

SCE stated that it is premature to require electric customers in its TAC area to pay for more expensive local deployment of resources, before a specific local need is identified.

Finally, SoCalGas stated that procurement decisions generally, as well as those specifically intended to reduce the use of Aliso Canyon, could have real impacts on the reliability of the interrelated gas and electric grid and customer affordability, and may actually serve to worsen reliability or environmental impacts.

7.4.2.2. Discussion

Similar to the discussion in Section 6.2 above related to fossil-fueled resources generally, with respect to Aliso Canyon issues specifically we agree

with the majority of parties that more analysis is needed before we order procurement of specific resources in specific locations. We find the CEJA and Sierra Club proposal for approximately 1,000 MW of storage located in the LA Basin based on the CAISO's local analysis interesting as a starting point, but the analysis conducted so far is incomplete. On the one hand, we do not want to proceed with requirements for resources that turn out not to reduce dependency on Aliso Canyon. On the other hand, it appears as though a great deal of resources are in the process of being developed in this area to meet our already-identified and already-required procurement for MTR purposes.

Commission staff will continue to evaluate the amount of storage and other zero-emitting resources being developed in the LA Basin, as part of determining whether there is a need for the Commission to take short-term action. This will also be part of our overall tracking of project development stemming from IRP and summer reliability procurement orders, among others. Once we collect this information and conduct additional analysis, we will have a better idea of the necessary steps to reducing or eliminating dependence on Aliso Canyon in the most effective manner.

In addition, as referenced above, we will be developing a more sophisticated modeling toolkit beginning in 2022, capable of local analysis, to help us better understand how to advance the policy objectives of reducing reliance on Aliso Canyon, reducing dispatch of natural gas generation, and contributing to an "orderly" retirement of the fossil-fueled generation fleet as it ages.

We plan to develop a pilot local area modeling tool to be integrated with our current system-wide modeling approach, and containing new, iterative

modeling functionality that will be the first of this kind for the Commission. This should help inform future Commission action in the longer term.

7.5. Definition of Renewable Hydrogen

The August 17, 2021 ALJ ruling included a proposed definition of renewable hydrogen, in anticipation of the Commission potentially allowing some resources utilizing renewable hydrogen to count toward procurement now or in the future.

The August 17, 2021 ALJ ruling proposed that any eligible renewable hydrogen projects meeting procurement ordered in this proceeding would be consistent with the Commission's recent decision (D.21-06-005) in the self-generation incentive program (SGIP) regarding the use of renewable hydrogen for behind-the-meter electricity generation. The SGIP decision did not definitively define renewable hydrogen, but identified the types of renewable hydrogen that would be eligible for SGIP incentives.

Ordering Paragraph (OP) 1 of D.21-06-005 updates the SGIP program to:

Define eligible renewable hydrogen fuel as hydrogen produced at a SGIP project site, or delivered to a SGIP project site by vehicle or dedicated pipeline, that was produced through non-combustion thermal conversion of biomass, or electrolysis using 100 percent renewable electricity, as defined by the Renewables Portfolio Standard, with the addition of large hydropower and excluding purpose-grown crops; require, if the renewable electricity is not generated on-site, the purchase program or load serving entity to provide bundled Renewable Energy Credits to the electricity purchaser. (OP 1, g.)

However, for purposes of IRP procurement, the ruling proposed to modify one provision, in the last phrase of the above requirements, to account for the difference between using renewable hydrogen behind the meter and in a

utility-scale power plant. Namely, the generating facility would be required to provide documentation to the procuring LSE that bundled renewable energy credits were retired for the electricity used to generate the renewable hydrogen used in the facility or provide other reasonably equivalent documentation if the electricity source is large hydropower.

The CEC is expected to address requirements for electricity generated by combustion of renewable hydrogen under the RPS program in the future, but that action has not yet occurred so the above requirement would be in place in the meantime.

This definition does not allow use of “directed” renewable hydrogen (*i.e.*, renewable hydrogen injected into the existing utility natural gas distribution system), because standards for injecting hydrogen into the gas distribution system are still under consideration and a tracking process for that hydrogen does not yet exist.²¹ In addition, hydrogen production using non-combustion thermal conversion of biomass would be allowed as an eligible feedstock, which means that gasification and/or pyrolysis of woody biomass may be used to produce the renewable hydrogen. However, hydrogen produced from steam reformed biomethane would not be authorized, due to other higher priority direct uses for the limited supplies of biomethane for clean vehicle fuels and/or directly displacing natural gas use for difficult-to-electrify industrial uses.²²

²¹ Defining renewable hydrogen and establishing standards for safe injection of renewable hydrogen into gas distribution lines is still under consideration in R.13-02-008.

²² See further discussion of this issue in D.21-06-021. In addition, as noted above, biomethane that is RPS-eligible would be eligible to be used to generate electricity for electrolysis that produces renewable hydrogen.

7.5.1. Comments of Parties

Party views were very mixed on the appropriate definition of renewable hydrogen for purposes of IRP procurement. While some generally agreed with following the SGIP approach, other parties pointed out that the SGIP context deals with much smaller quantities of potential fuel use, making it possibly an inappropriate model for IRP. Other parties felt the proposed definition did not go far enough to ensure the renewable hydrogen would be zero emissions. In all, nearly every party that commented on this topic proposed a slightly different definition.

The only parties supporting the definition as stated in the August 17, 2021 ALJ ruling were CCE, GSCE, PG&E, and TURN.

AEE expressed concern that the Legislature would supersede any definition we set here. AEE also specifically wants a definition of eligible biomass feedstocks.

AWEA would like a more open-ended definition, to give developers of renewable hydrogen flexibility to market GHG-free attributes separate from RPS.

Calpine advocated for including “blue” hydrogen.

CalWEA, NRDC, PCF and CEJA would like eligibility limited to “hydrogen produced via electrolysis using 100 percent renewable electricity.” CEJA would add a requirement that the renewables produce zero carbon and zero co-pollutant emissions.

Diamond would prefer that delivery of hydrogen fuel via the natural gas pipeline not be excluded while the technology is still developing.

EDF would exclude biomass generation that produces hydrogen and supports analysis on different forms of electrolysis.

GHC would allow electrolytic, steam reformation of biogas, and thermal conversion or gasification of organic matter or other waste streams. According to GHC, renewable hydrogen should be eligible if produced from non-fossil-fuel feedstocks and emits zero or de minimis GHG emissions on a lifecycle basis.

IEP and Cal Advocates recommended excluding hydrogen produced from large hydroelectric generation to avoid resource shuffling. Cal Advocates also asked that we specify pyrolysis of woody-biomass as an eligible conversion technology, in place of the broader term “non-combustion thermal conversion of biomass.”

SDG&E would have us maintain the definition included in SB 1369 (Stats. 2018, Ch. 567) codified as Public Utilities Code Section 400.2, which states: “Green electrolytic hydrogen means hydrogen gas produced through electrolysis and does not include hydrogen gas manufactured using steam reforming or any other conversion technology that produces hydrogen from a fossil fuel feedstock.”

Shell commented that the proposed definition is unduly restrictive.

SoCalGas recommended adoption of the following definition: “hydrogen that is not produced from fossil fuel feedstocks.”

UCS suggested excluding hydrogen produced from large hydroelectric generation or thermal conversion of woody biomass.

7.5.2. Discussion

Since this decision does not authorize additional eligibility for fossil-fueled resources, strictly speaking it is not necessary for us to adopt a definition of renewable hydrogen in this decision. However, there may be some benefit in giving developers and LSEs some certainty about what will be considered

eligible if and when such resources are counted toward IRP resource requirements, particularly under a programmatic approach.

We also agree with AEE that it is likely that there may ultimately be a uniform state definition of renewable or green hydrogen that could supersede this one. But in the meantime, on an interim basis, we adopt the definition as originally proposed in the August 17, 2021 ALJ ruling, which relies on the SGIP definition, with the addition of the requirement that the generating facility would be required to provide documentation to the procuring LSE that bundled renewable energy credits were retired for the electricity used to generate the renewable hydrogen used in the facility.

As recommended by several parties, we will also exclude from eligibility for IRP purposes any hydrogen produced from large hydroelectric facilities, to avoid the potential for encouraging resource shuffling.

8. Next Steps

In early 2022, the assigned Commissioner and ALJ anticipate issuing a revised scoping memo for this proceeding, in order to set further scope and a schedule of activities in 2022 and 2023. In the meantime, since numerous upcoming activities have been described within this decision, Table 8 below gives the general structure and timing of the next two-year cycle of IRP during 2022 and 2023, with emphasis on 2022. This schedule will set us up for adoption of the next PSP, while also making progress on the other important policy initiatives described in this decision, including a programmatic approach to procurement requirements, analysis of risk of retirement of existing resources, and assessing the need for additional requirements for locationally-targeted procurement.

Table 8. General Schedule for Adoption of Next PSP in 2023

Item	Schedule
PSP and TPP Activities	
Commission staff dissemination of proposed inputs and assumptions for use in the 2022-23 IRP cycle	May 1, 2022
Updates to certain LSE filing requirements (<i>e.g.</i> , LSE GHG planning targets)	May 1, 2022
Individual LSE IRP filings	September 1, 2022
Vetting of proposed 2023-2024 TPP portfolios	4 th Quarter 2022
Aggregation and analysis of individual IRP filings	3 rd Quarter 2022 through 1 st Quarter 2023
Ruling to propose the 2023 PSP and 2024-2025 TPP portfolios	3 rd Quarter 2023
Proposed decision adopting 2023 PSP and 2024-2025 TPP portfolios	4 th Quarter 2023
Cost Allocation Issues (modified CAM)	
Proposed decision adopting modified CAM	1 st Quarter 2022
IRP Programmatic Procurement Requirements	
Workshop on programmatic approach	2 nd Quarter 2022
Ruling with proposal for stakeholder comments	3 rd Quarter 2022
Risk of Retirement and Locationally-Targeted Procurement Analysis	
Development of additional modeling capabilities	2 nd and 3 rd Quarters 2022
Workshops and/or rulings seeking stakeholder input	1 st Quarter 2023

9. Comments on Proposed Decision

The proposed decision of ALJ Fitch in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on or before _____ by the following parties:

_____.

Reply comments were filed on or before _____ by the following parties: _____.

10. Assignment of Proceeding

Clifford Rechtschaffen is the assigned Commissioner and Julie A. Fitch is the assigned ALJ in this proceeding.

Findings of Fact

1. All LSEs required by D.18-02-018 and D.2-03-028 to file an individual IRP or documentation substantiating eligibility for an exemption did so by no later than September 1, 2020.

2. The following entities provided the appropriate information to justify an exemption from filing an individual IRP: Anza Electric Cooperative, EnergyCal USA (dba YEP Energy), Gexa Energy California, Liberty Power Delaware, Liberty Power Holdings, Plumas Sierra Cooperative, Praxair Plainfield, Surprise Valley Electric Cooperative, and Valley Electric Association.

3. The individual IRP filings of the following IOUs provided all of the required information to an adequate degree or better: Bear Valley Electric Service, Liberty Utilities, Pacific Gas and Electric, PacifiCorp, San Diego Gas & Electric, and Southern California Edison.

4. The individual IRP filings of the following CCAs provided all of the required information to an adequate degree or better: Apple Valley Choice Energy, Central Coast Community Energy, City of Commerce, Clean Energy Alliance, Clean Power San Francisco, East Bay Community Energy, Marin Clean Energy, Peninsula Clean Energy Authority, Pioneer Community Energy, Rancho Mirage Energy Authority, Redwood Coast Energy Authority, San Jose Clean Energy, Santa Barbara Clean Energy, Silicon Valley Clean Energy Authority, and Valley Clean Energy Alliance.

5. The following CCAs included inadequate information in their individual IRPs: City of Baldwin Park, City of Pomona, Clean Power Alliance of Southern California, Desert Community Energy, King City Community Power, Lancaster Choice Energy, Pico Rivera Innovative Municipal Energy, San Diego Community Power, San Jacinto Power, Sonoma Clean Power Authority, and Western Community Energy.

6. The following ESPs included inadequate information in their individual IRPs: 3 Phases Renewables, Agera Energy, American PowerNet Management, Calpine Energy Solutions, Calpine PowerAmerica CA, Commercial Energy of Montana, Constellation NewEnergy, Direct Energy Business, EDF Industrial Power Services, Pilot Power Group, Regents of the University of California, Shell Energy, and Tiger Natural Gas.

7. For the individual IRPs of all LSEs, the Commission must evaluate all information associated with serving load and listed in Public Utilities Code Section 454.52.

8. It has been difficult for the Commission to accomplish development of both an RSP and a PSP within one two-year cycle of IRP.

9. Commission staff analysis to aggregate the preferred confirming portfolios included in the individual LSE IRPs and check for overlap and double-counting, while taking into account POU portfolios, was reasonable and necessary.

10. The aggregated LSE IRP resources in the 46 MMT portfolios met the GHG requirements for 2030, but the 38 MMT portfolios did not. The aggregated LSE IRP resources in the 46 MMT and 38 MMT portfolios failed to meet the Commission's reliability target in LOLE.

11. Commission staff augmented the aggregated portfolios for both the 46 MMT and 38 MMT GHG targets to add two additional years (2031 and 2032)

for transmission planning purposes and to account for the requirements of D.21-06-035, which was adopted after the individual IRPs were filed by LSEs. These scenarios are referred to as the Core Portfolios.

12. PCM analysis demonstrated that the 38 MMT Core Portfolio meets LOLE reliability requirements in 2026 and 2030.

13. PCM analysis demonstrated that the 38 MMT Core Portfolio, updated with the 2020 IEPR demand forecast and high EV penetration, meets LOLE reliability requirements in 2026, 2030, and 2032 and produces modeled GHG emissions very close to the 38 MMT target.

14. A reliability and policy-driven base case portfolio for the CAISO 2022-2023 TPP based on the PSP portfolio is consistent with the Commission's recent approaches to recommending portfolios for TPP analysis.

15. A TPP policy-driven sensitivity portfolio based on the 30 MMT GHG target by 2030 has not yet been fully developed for busbar mapping and will require at least an additional several months of work to make ready for TPP analysis.

16. Page 70 in D.21-06-035 contains an editing error that inadvertently suggested that a ten-year contract period could begin before a project is online.

17. D.21-12-015 addresses electric summer reliability needs in 2022 and 2023.

18. Modeling of system reliability needs in 2023-2026, by both our staff and the CEC, find that the resources we have already required in D.19-11-016, D.21-06-035, and D.21-12-015 should be capable of maintaining reliability, assuming that all resources come online and there are no battery supply chain disruptions of a significant magnitude.

19. If multiple risks occur simultaneously (*e.g.*, project delays, battery supply chain delays, extreme weather, and lack of access to imports) the Commission may still need contingency options for maintaining reliability.

20. The PSP portfolio includes 1,500 MW of OOS renewable resources, the best geographic location for which may be informed by the outcome of the 2021-2022 TPP analysis.

21. The PSP portfolio includes 1,700 MW of offshore wind by 2032 that will be analyzed by the CAISO in the TPP.

22. The State of California has a policy interest in ensuring that at least a portion of the central cost transmission capacity associated with Diablo Canyon can be utilized for offshore wind development.

23. The CAISO's 2020-2021 TPP identified two storage projects as preferred alternatives to two previously-approved transmission upgrades.

24. There is currently no uniform state definition of renewable or green hydrogen.

Conclusions of Law

1. The Commission should approve an exemption from filing an individual IRP in 2020 for the following entities: Anza Electric Cooperative, EnergyCal USA (dba YEP Energy), Gexa Energy California, Liberty Power Delaware, Liberty Power Holdings, Plumas Sierra Cooperative, Praxair Plainfield, Surprise Valley Electric Cooperative, and Valley Electric Association.

2. The Commission should approve the individual IRPs of the following IOUs: Bear Valley Electric Service, Liberty Utilities, Pacific Gas and Electric, PacifiCorp, San Diego Gas & Electric, and Southern California Edison.

3. The Commission should certify the individual IRPs of the following CCAs: Apple Valley Choice Energy, Central Coast Community Energy, City of

Commerce, Clean Energy Alliance, Clean Power San Francisco, East Bay Community Energy, Marin Clean Energy, Peninsula Clean Energy Authority, Pioneer Community Energy, Rancho Mirage Energy Authority, Redwood Coast Energy Authority, San Jose Clean Energy, Santa Barbara Clean Energy, Silicon Valley Clean Energy Authority, and Valley Clean Energy Alliance.

4. The Commission should not certify the individual IRPs of the following CCAs, pending them resubmitting required information discussed in Section 2 of this decision: City of Baldwin Park, City of Pomona, Clean Power Alliance of Southern California, Desert Community Energy, King City Community Power, Lancaster Choice Energy, Pico Rivera Innovative Municipal Energy, San Diego Community Power, San Jacinto Power, Sonoma Clean Power Authority, and Western Community Energy.

5. The Commission should not approve the individual IRPs of the following ESPs, pending them resubmitting required information discussed in Section 2 of this decision: 3 Phases Renewables, Agera Energy, American PowerNet Management, Calpine Energy Solutions, Calpine PowerAmerica CA, Commercial Energy of Montana, Constellation NewEnergy, Direct Energy Business, EDF Industrial Power Services, Pilot Power Group, Regents of the University of California, Shell Energy, and Tiger Natural Gas.

6. The Commission should require the entities that did not provide adequate information to refile this supplemental information associated with their individual IRPs via Tier 2 Advice Letter by no later than April 1, 2022. The information may be filed as an appendix or supplement to the September 2020 individual IRPs.

7. The Commission should continue a two-year IRP cycle, but should focus each cycle on the development and adoption of a PSP. An RSP may be evaluated

and adopted, as needed by policy circumstances, such as when CARB updates its climate change scoping plan, or when other circumstances warrant.

8. Filing requirements for the next set of individual IRP filings should be based on the PSP adopted in this decision, and the analysis conducted to inform it, such as the RESOLVE sensitivity portfolios.

9. For the filing of individual IRPs in 2022, each LSE should be required to file a plan and a preferred portfolio that meets its share of both the 38 MMT GHG target by 2030, as well as a 30 MMT target based on the 30 MMT sensitivity portfolio analyzed in this IRP cycle.

10. LSEs should be required to include planning information in their next individual IRP filings in 2022 out through 2035.

11. The Commission should adopt the 38 MMT Core Portfolio, updated with the 2020 IEPR demand forecast and high EV assumptions, as the preferred system portfolio, as further described in Section 4.

12. The Commission should recommend to the CAISO that the PSP portfolio adopted in this decision should be its reliability base case and policy-driven base case for its 2022-2023 TPP.

13. The Commission should delegate to Commission staff to determine if a TPP policy-driven sensitivity portfolio based on the 30 MMT GHG target by 2030 can be developed for analysis by the CAISO in the next few months.

14. Additional procurement requirements for 2023 were addressed in D.21-12-015 and therefore do not need to be further addressed here. The Commission should not amend the 2023 procurement requirements in D.21-06-035.

15. An IOU that uses CAM for cost recovery of system reliability resources for any year after 2024 should not also be allowed to count those resources toward their MTR requirements in D.21-06-035.

16. PG&E's proposal for an incentive mechanism to encourage early procurement for 2023 system needs is not fully developed enough to be adopted and therefore the Commission cannot adopt it at this time.

17. The Commission should encourage LSEs to take into account project viability, including such issues as transmission access, deliverability, developer experience, and ability to secure timely financing, during their procurement processes.

18. The Commission and staff, in collaboration with the CEC, should continue to monitor the occurrence of procurement risks (*e.g.*, project delays) and continue to analyze the need for additional fossil-fueled resources, locationally-targeted procurement, and the risk of retirement of existing resources.

19. The Commission should further explore the development of a programmatic approach to IRP procurement requirements as soon as possible.

20. The Commission should correct an editing error in D.21-06-035 on page 70 that inadvertently suggested that a ten-year contract period could begin before a project is online. The text should be replaced as discussed in Section 6.3.

21. Commission staff should produce an addendum to the busbar mapping of the PSP portfolio if the 2021-2022 TPP outputs identify preferable locations for OOS renewable resources to be mapped.

22. Federal and State plans for offshore wind development will benefit the electric system and the Commission should include this technology as a candidate resource in capacity expansion modeling as soon as possible.

23. The Commission should encourage LSEs to pursue viable opportunities for offshore wind projects as soon as possible.

24. Interconnection and deliverability on the transmission system ultimately falls within CAISO tariff provisions regulated by FERC.

25. PG&E should be required to consult with the Commission's Executive Director and/or Deputy Executive Director for Energy and Climate Policy before taking any action that would impact its transmission deliverability assets associated with Diablo Canyon.

26. PG&E should be required to procure the two storage projects identified in the 2020-2021 TPP as preferable alternatives to transmission upgrades. In order to accomplish this, PG&E should be allowed to deviate from all-source procurement requirements in order to develop the particular storage needs identified in the TPP at the Kern-Lamont Substation and the Mesa Substation. For the Kern-Lamont project, PG&E should conduct the procurement as the CPE according to D.20-06-002, because the project is in a local area. For the Mesa project, PG&E may be allowed to forego procurement if a suitable project has already been procured as part of MTR procurement.

27. The Commission should adopt an interim definition of renewable hydrogen to send a signal to developers and LSEs in the event of eligibility for future procurement requirements.

O R D E R

IT IS ORDERED that:

1. The following load serving entities are approved as exempt from the requirements in Decisions (D.) 18-02-018 and D.20-03-028 to file an individual integrated resource plan in 2020: Anza Electric Cooperative, EnergyCal USA (doing business as YEP Energy), Gexa Energy California, Liberty Power

Delaware, Liberty Power Holdings, Plumas Sierra Cooperative, Praxair Plainfield, Surprise Valley Electric Cooperative, and Valley Electric Association.

2. The individual integrated resource plans filed in 2020 and supplemented or revised in 2021 are hereby approved for the following investor-owned utilities: Bear Valley Electric Service, Liberty Utilities, Pacific Gas and Electric, PacifiCorp, San Diego Gas & Electric, and Southern California Edison.

3. The individual integrated resource plans filed in 2020 and supplemented or revised in 2021 are hereby certified for the following community choice aggregators: Apple Valley Choice Energy, Central Coast Community Energy, City of Commerce, Clean Energy Alliance, Clean Power San Francisco, East Bay Community Energy, Marin Clean Energy, Peninsula Clean Energy Authority, Pioneer Community Energy, Rancho Mirage Energy Authority, Redwood Coast Energy Authority, San Jose Clean Energy, Santa Barbara Clean Energy, Silicon Valley Clean Energy Authority, and Valley Clean Energy Alliance.

4. The following community choice aggregators' individual integrated resource plans (IRPs) are not certified in this decision and they shall file supplemental information as detailed in Section 2 of this decision via a Tier 2 Advice Letter no later than April 1, 2022: City of Baldwin Park, City of Pomona, Clean Power Alliance of Southern California, Desert Community Energy, King City Community Power, Lancaster Choice Energy, Pico Rivera Innovative Municipal Energy, San Diego Community Power, San Jacinto Power, Sonoma Clean Power Authority, and Western Community Energy.

5. The following electric service providers' individual integrated resource plans (IRPs) are not approved in this decision and they shall file supplemental information as detailed in Section 2 of this decision via a Tier 2 Advice Letter no later than April 1, 2022: 3 Phases Renewables, Agera Energy, American

PowerNet Management, Calpine Energy Solutions, Calpine PowerAmerica CA, Commercial Energy of Montana, Constellation NewEnergy, Direct Energy Business, EDF Industrial Power Services, Pilot Power Group, Regents of the University of California, Shell Energy, and Tiger Natural Gas.

6. The core portfolio based on the 38 million metric ton greenhouse gas target by 2030 described in Section 4 of this decision, which includes the 2020 Integrated Energy Policy Report demand forecast utilizing the high electric vehicle assumptions, is adopted as the portfolio for the preferred system plan for 2021.

7. The Commission transmits to the California Independent System Operator (CAISO) for use in its 2022-2023 Transmission Planning Process (TPP) the Preferred System Plan portfolio adopted in Ordering Paragraph 6 above and reflected in Attachment A to this decision, as both the reliability base case and the policy-driven base case. The Commission also delegates to Energy Division staff, in consultation with staff of the California Energy Commission and CAISO, the development of a policy-driven sensitivity portfolio based on a 30 million metric ton greenhouse gas target, and associated busbar mapping, if it is determined by Commission staff to be feasible within the next few months.

8. After 2023, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall not be authorized to count procurement in compliance with Decision (D.) 21-12-015 that utilizes the cost allocation mechanism toward compliance with D.21-06-035 requirements.

9. The sentence on page 70 of Decision 21-06-035 that reads “This ten-year requirement applies to the period of the contract, and is not based on the resource’s online date” is replaced with the following text: “This minimum ten-year contract period is intended to spur the development of new resources and

begins once the new resource is online and delivering energy and/or providing capacity. In the event that a resource is delayed in coming online, it is permissible for a load-serving entity to utilize capacity or take energy deliveries from the same contractual counterparty from other owned resources to show compliance with the online date requirements. This still does not relieve the load-serving entity of the requirement to show a ten-year contract for the new resource, however, once it comes online.”

10. Pacific Gas and Electric Company shall consult with the Commission’s Executive Director and/or Deputy Executive Director for Energy and Climate Policy prior to taking any action that would impact its transmission deliverability assets associated with the Diablo Canyon Power Plant.

11. Pacific Gas and Electric Company (PG&E) shall conduct a competitive solicitation for the 95 megawatt four-hour storage project at the Kern-Lamont Substation identified in the California Independent System Operator’s 2020-2021 Transmission Planning Process as the Central Procurement Entity under the process established in Decision 20-06-002. PG&E shall submit the results of its progress in a Tier 2 Advice Letter by no later than August 1, 2022.

12. Pacific Gas and Electric Company (PG&E) shall file a Tier 1 Advice Letter by April 1, 2022 explaining whether a storage project has been procured as part of the procurement required by Decision 21-06-035 to be online by the end of 2022, and otherwise meeting the operational requirements identified in the California Independent System Operator’s 2020-2021 Transmission Planning Process for a 50 megawatt four-hour storage project at the Mesa Substation as a transmission alternative. If a suitable project has not been identified by April 1, 2022, then PG&E shall conduct a solicitation and file a Tier 2 Advice Letter by the end of 2022 proposing a storage project that will meet the identified

need and may seek cost recovery via the cost allocation mechanism but then shall not count the storage toward its procurement required in Decision 21-06-035.

13. The following definition of renewable hydrogen is adopted on an interim basis for any eligible procurement associated with this proceeding, until a uniform state definition is available: “Eligible renewable hydrogen fuel is hydrogen produced at a project site, or delivered to a project site by a vehicle or dedicated pipeline, that was produced through non-combustion thermal conversion of biomass, or electrolysis using 100 percent renewable electricity, as defined by the Renewables Portfolio standard, excluding purpose-grown crops. If the electricity is not generated on site, the generating facility is required to provide documentation to the procuring load serving entity that bundled renewable energy credits were retired for the electricity used to generate the renewable hydrogen used in the facility.”

This order is effective today.

Dated _____, at San Francisco, California.

ATTACHMENT A:
Modeling Assumptions for the
2022-2023 Transmission Planning Process

Attachment 1:

[R2005003 Fitch PD Attachment A Agenda 2-10-2022](#)